



# CONQUEST OF AGE THE

EXTRAORDINARY STORY  
OF DR. PAUL NIEHANS

# Conquest of Age

is the first book about Dr. Paul Niehans, the Swiss pioneer in cellular therapy, and undoubtedly the most enigmatic and controversial medical figure of our time.

Dr. Niehans became an international celebrity in 1954, when he was called to the bedside of Pope Pius XII, then apparently near death. The Pope's surprisingly rapid recovery after Dr. Niehan's visit caused widespread speculation, both in medical circles and in the popular press, about the nature of the Pontiff's treatment, its efficacy and possible perils, and about the mysterious physician who administered it. "Cellular Therapy Guarantees Eternal Youth," proclaimed one European newspaper, while other opinions denounced Niehans's work as dangerous quackery.

Since the Pope's cure, there have been frequent press reports that many of Europe's most famous old men, including Chancellor Adenauer and Somerset Maugham, were patients at Dr. Niehans's secluded sanitarium in Switzerland.

CONQUEST OF AGE is the full story behind these reports and speculations — the astonishing story of Dr. Niehans and cellular therapy — a treatment in-

*(continued on back flap)*



# CONQUEST OF AGE

*The Extraordinary Story of*

*Dr. Paul Niehans*

# CONQUEST

*The Extraordinary Story*

BY GILLES LAMBERT

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O F A G E

*of Dr. Paul Niehans*



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PART I

*Paul Niehans*

## *New Ideas about Old Age*

PARALLEL with the tremendous progress made in every field of technology over the last fifty years, mankind's knowledge of protection against disease has improved continuously and many "potential" years have been added to the span of human life.

The prolongation of life is a phenomenon common to every area with a high standard of living. In the United States today the life expectancy of a newborn male child is seventy. A century ago an American citizen at birth had only forty years to live according to his statistical potential, and in the eighteenth century a human life was reckoned at an average of thirty-five and one-half years—without differentiation of sex and on condition that the reckoning begin after the dangerous first week of life.

This increased life span which modern science offers the human race has important consequences. It involves innumerable problems. In Europe, for in-

stance, the question of state-employee retirement now confronts every government. (Retirement regulations and salary scales established, in most cases, during the last century and taking no account of this increase in life's duration, result in enormous burdens which weigh heavily on French, English and Italian budgets.)

It has become apparent that these supplementary years provided by science constitute a valuable gift only on condition that man knows how to make good use of them. Adding years to life is a splendid thing; but the corollary is indispensable: adding life to years; gerontology—the science of man's normal aging—is the result of this concern.

Most of our ancestors' ideas about aging—or senescence—were absurd. They anxiously watched their own bodies, or other people's, for the first premonitory signs of age. Old age for them was a hidden enemy that suddenly appeared in their path. As long as you managed to avoid its snares, you were young; afterwards, all resistance being futile, there was nothing else you could do but coast toward death in a series of stages during which you successively abandoned strength, mind and personality.

Montaigne advises pondering the ailments of age and the inevitability of death while still quite young, hoping thereby to fend off old age's worst effect, the surprise attack from which so few recover. Subse-

quently, innumerable authors described this cunning attack, which occurs during approximately the fiftieth year.

We know today the naïveté of these notions.

Man is born old.

In other words, the aging process has already started in our organism before we first see the light of day. Quite precisely, after the fourth week following the fertilization of the ovum. It is only recently that scientists have broached the mysteries of embryonic life. (Some maintain that during this period every living creature undergoes all the transformations of the species since its origin, as in an accelerated film.) The measurements of the embryo during the first weeks of its existence have been the object of precise study. It has been discovered that in a month its size increases from zero to fifteen centimeters, its weight from zero to some two hundred grams. If this increase were to continue at the same rate, the embryo, at the end of the nine intra-uterine months, would be a giant more than twelve feet tall and weighing more than six hundred pounds.

Many specialists have eagerly taken the next step and inferred that aging begins at the fourth week—as soon as the initial “rage to live” abates. So that today it is possible to maintain that at the moment of our birth we are already little old men eight months old! (The Chinese, whose doctors were among the

first to envisage a science of old age, include the nine months of intra-uterine life in reckoning age.)

The phenomenon of senescence, which begins sooner than our ancestors realized, from this point on coincides with the life of the human organism. Its ultimate form is death, considered as the inevitable term of all of life's adventures—until species were discovered whose corpses did not exist. Its extreme forms are those of senility—today dealt with as diseases, thanks to gerontology, the science of old age, and to geriatrics, the science of the diseases particular to old age.

The first notion of gerontology was conceived by an American, Dr. Ignatz Leo Nascher (born in Vienna in 1863; emigrated to the United States at the age of six months), who coined the word "geriatrics" in an article which appeared in the *New York Medical Journal* on August 21, 1909.

In 1910, Dr. Nascher published a theory of senescence based on cellular modifications and in 1919 an article called, "Why Old Age Ends in Death."

He was meanwhile appointed the first "lecturer on geriatrics" at the Fordham University Medical School. Having become a member of the public welfare department of New York, he devoted several years to the study of the inhabitants of the Bowery. (His book describing his experiences is called *The Wretches of Povertyville*.)



In 1942, Dr. Nascher was appointed honorary president of the American Geriatrics Society which had just been created in Atlantic City. Before his death in New York, on Christmas Day, 1944, having preserved at eighty-one all the intellectual acuity of his younger years, this pioneer gerontologist still had time to present to his colleagues in the society a report entitled, "Why I Must Die."

During the period when Nascher was reaching his first conclusions on the science of old age, a European investigator, quite unaware of these studies, was also engaged in similar research. This was the German physiologist, Rubner, who published in Munich, in 1908, a work on the problems of life's duration. Like Nascher, Rubner relied on Alexis Carrel's early works. Very soon thereafter, a number of investigators extended the studies of these precursors. Among the most brilliant servants of gerontology in the United States we must include Raymond Pearl (Baltimore) and Dr. Clive MacCay, who is still teaching at Cornell University.

It was only after the Second World War that the World Health Organization, meeting at the Palais des Nations in Geneva, decided to centralize all research on old age and aging. Several methods have been used and already some tens of thousands of observations permit us to arrive at a synthetic notion of the human body's exhaustion. International con-

ventions or specialized study groups meet nearly every year.

In 1957, a "symposium," convened at Gatlinburg, Tennessee, under the auspices of the American Institute of Biological Sciences, allowed us to take stock of our knowledge in the field of gerontology. All the fundamental biological processes of aging were passed in review. Investigators shed new light on the transformations of the circulatory system and various hormonal evolutions, but interest was concentrated on other research, for in the study of senescence one is always brought back to the modifications of the cellular processes—to the essential problem of the cell.

One of the speakers at the symposium reminded his colleagues that the notion of the "cell" is older than is generally thought. It was in the sixteen century that an Englishman, Robert Hooke, carefully examining first a piece of skin, then a drop of blood, and lastly some muscle tissue, under his microscope, discovered in all three the same chambers resembling those of a honeycomb. The cell concept was born. And an error as well, for Hooke wrote that anything smaller than one of these empty cells would be invisible. (Today we know that a single human cell sometimes contains more than a thousand different enzymes—the enzymes themselves being extremely complex chemical substances!)

At the Gatlinburg Congress, another extremely important report concerned the aging of these very enzymes. The cell, which to Hooke appeared as indivisibly diminutive, is now regarded as nothing more than a door opened on a whole new world. Here, amid an intensive activity which for the most part still escapes us, are found the secrets of age and aging.

With age, the increase of inactive cells in our bodies becomes considerable. It was long thought—and still is by some—that this increase was due to transformations of connective tissue.

The famous serum of Alexander Bogomoletz—whose vogue passed, one might say, with that of his chief guinea pig, Stalin—was founded on this conviction.

Bogomoletz had exhaustively studied the work of another Russian genius, Metchnikoff, who, as a young Jewish student from Kharkov, worked his way to Paris in order to meet Pasteur. He was on the track of certain alien cells which behaved incomprehensibly in the human organism: they moved according to apparently anarchic itineraries, gathering at certain points impossible to predict. Pasteur, who was to die within the year, had time to offer the young man the means necessary for the pursuit of his experiment.

Years later, in 1901, the Russian student—virtually

blind from examining cultures with his eyes screwed to the microscope—received the Nobel prize for his discovery of phagocytes (destructive cells). He had just proved that the human organism is the theatre of a permanent struggle between its enemies, the bacteria (which we absorb by the billion every second) and its natural allies which progressively destroy them. The bacteria sometimes manage to overcome the phagocytes. This is the occasion of disease, sometimes of death. One of the consequences of Metchnikoff's discovery was immunity: a whole diplomacy was created, responsible for establishing good terms with these precious phagocytes, and immunization by serum—vaccination—was the result.

The discovery had other consequences.

The Ukrainian biologist, Bogomoletz, had originally specialized in the study of protoplasm, which consists of gelatinous substances that fill our cells and serve as a cement to all the other substances; these colloids—which Auguste Lumière called *human jelly*—have a tendency to change as we grow older. They dry up like paste at the bottom of a jar, forming curds, and as a consequence our cells shrivel. This causes an almost universal hardening of our organs—but particularly of one essential tissue—connective tissue—which nourishes all the others, connects organs, and permits the formation of scar tissue.

Bogomoletz suddenly realized that he had found

the key to aging: the deterioration of connective tissue! And the secret which would permit him to put a stop to this process: the application of the discoveries concerning immunity to the transformations of protoplasm.

If the phagocytes could be made to work in favor of the conservation of protoplasm, one could achieve the cell's eternal youth, he thought, and consequently that of the connective tissue, and ultimately of the entire organism. His serum against old age was the result of this idea. At first Stalin did not put much confidence in this biologist who, though barely sixty, looked over eighty. He nevertheless agreed to let himself be given several shots. The result was not convincing, since both patient and doctor died—several months apart.

But Bogomoletz's studies, which enjoyed considerable publicity, had at least the merit of once again concentrating researchers' attention upon the transformations of connective tissue and the substances of the cell—in particular the enzymes.

The last Congress on Old Age, which met at Merano, Italy, in September, 1957, demonstrated that our knowledge of the cellular universe is growing more complete every day. We know now that each of these tiny chambers harbors several large molecules (the chromosomes) which form a nucleus. We have gone further: each chromosome is formed of



super-molecules, the genes, to which are attributed an extraordinary power: that of transmitting the seeds of heredity and controlling the whole organism.

It is generally maintained that life begins with the genes. Subtle combinations of genes with enzymes determine the structure of an organism. Although there is much speculation at this level of research, it is certain that as long as the enzymes transmit their orders of renewal, as long as the cells divide, the organism remains vigorous. Each cell has its own rhythm. The genital cells live only a few hours; those of the epidermis, in constant rearrangement, only a few weeks; the blood cells never last longer than 140 days (the red corpuscles being the longer-lived; the white, much less tenacious). The nerve cells, which are not renewed, live as long as the organism itself. There are as many of them in the brain as there are stars in the Milky Way.

The general architecture of the human body, starting from these varied constitutive elements, is of an unimaginable complexity. But the organism as a whole functions remarkably well. If its initial impulse relaxes after the fourth week of intra-uterine life, the urge to live remains no less constant, despite many stoppages and slow-ups. A moment arrives, however, when the breakdowns become increasingly powerful. This collapse has given rise to long discussions.

Gerontologists class the different periods of human life as follows:

- to forty-five years, the period of youth;
- from forty-five to sixty, the first period of active pre-senescence, with numerous transformations;
- from sixty to seventy-five, the second period of quiescent pre-senescence;
- from seventy-five to approximately ninety-four, the period of confirmed senescence, or primary old age;
- from ninety-four to death, the period of senility (or vegetative period).

The popular conception of old age generally applies to a person of sixty. At this age the cells receive fewer secretions, the number of dead cells in the organism increases, the formation of scar tissue becomes extremely slow. This crisis frequently corresponds to the exhaustion of the internal secreting action of the sexual glands (and is therefore more precocious in women). This is the beginning of physiological old age.

"At this moment," wrote Dr. Paul Niehans in 1954, "injections of cells can restore strength to the affected organs and, afterwards, the new cells can prevent successive breakdowns.

"I have tried to render *all the organs* affected by

age capable of once more functioning properly, then to strengthen the entire organism by a revitalization of its sexual glands. I put foetal cells and young cells at the disposition not only of exhausted or ill people, but also of those affected by age. Each afflicted organ, including the sexual glands, receives corresponding cells from a healthy organ."

Such is the definition, furnished by its inventor, of the famous "cellular therapy," the treatment by new cells from animal embryos, which constitutes one of the most controversial questions of modern medical history.

Although today, in Germany and many other countries, almost every hospital has set up cell-injection services, in France and in America there are many doctors who consider an injection of this kind a criminal error. Honorably received in all of Central Europe, in Russia, in Scandinavia, cellular therapy scarcely dares show itself in France and has never obtained its visa for the United States.

The debate is open. Immoderate enthusiasm, opposition on principle, jealousy, even hatred, have made it a venomous one. Mention Niehans even in Switzerland, his native country, and the reaction will be extreme.

For some, cellular therapy as Niehans has patiently codified it, is the greatest discovery of our times. Its consequences may be enormous: it questions the en-

tire traditional conception of medicine and biology. New and fertile perspectives open upon the cure of the principal diseases, on rejuvenation, on the prolongation of life. The graft of living cells offers a possible solution to medical problems as a whole and, denying classical therapy based upon medication, may permit man to realize his oldest dream, that of eternal youth.

A familiar law of nature gives every earthly creature the hope of living five times the duration of its period of growth. This is an average which certain species readily exceed. Man's period of growth lasts twenty years: the *average* duration of his life should therefore be a century. We die too soon. Why? Has a subtle equilibrium been destroyed in the depths of our history? No one knows. But some maintain that a new mixture of cells can restore man—and rapidly—to harmony with nature. Cellular therapy is the first serious warning shot man has aimed at death. Death is not inevitable, the partisans of cellular therapy explain. Contrary to what the resigned proclaim, it is not a law of nature. Theoretically and according to its potential, the cell is immortal. Since Carrel's experiments in 1905, we know that tissues can be kept alive indefinitely under favorable conditions.

Carrel has demonstrated, thanks to numerous experiments, the definitive youth of cells—on condition that they are assured certain particular care. A

quarter of a century after the death of a chicken, cells taken from it showed no signs of aging. The experiment, continued for six generations, might well have lasted still longer, until no one would have hesitated to qualify these cultured cells as immortal.

The German biologist, August Weismann, who dedicated his life to the study of Infusoria (creatures consisting of a single cell, yet equipped with a digestive and respiratory system), proved that in the life cycle of this privileged animal there is no such thing as a corpse. Like all cells, Infusoria reproduce by division, but never die a natural death. (Recently there has been feverish research into the immortality of Infusoria.) Upon close consideration, is not the transmission of genes from generation to generation of man himself, an example of immortality?

Some go so far as to claim that cellular therapy will make possible the automatic prolongation of life and the processes of regeneration. They believe that a man who has lost an arm, for instance, will see that arm grow again after the proper injection. This hypothesis has ensnared its adherents in many discussions. They are accused of living in a Utopia, a fantasy world of science-fiction. They reply that man would be merely following the example of certain animals which already possess this faculty. Everyone knows that the crab's torn claw grows again, the starfish's arm, the lizard's tail.



The adversaries of the method rest their case on a well-filled dossier, but those who contest *all* effectiveness of the new-cell injections are increasingly rare. A year or two ago many doctors shrugged their shoulders and refused even to take this theory into consideration. They relegated new cells, once and for all, to the ranks of footbaths and laying-on of hands. Today such dismissal is rarer, though the essential argument remains the same. We do not know how cellular therapy works; it is an empirical method.

But this we know: Niehans rejuvenates or treats each afflicted organ with an injection from a corresponding organ. He declares that by a mysterious migration within the body the new cells are "drawn" toward a homologous organ. A recent experiment was conducted in Heidelberg with phosphorous-marked cells whose movement in an animal's organism was followed by a Geiger counter. This experiment seems to confirm Niehan's thesis. Liver cells proceed toward the liver, those from the pancreas toward the pancreas. But why?

In the United States, opposition to cellular therapy is particularly strong. For the specialists of the powerful American Medical Association, the human cell is a forbidden zone, bordering on the mysteries of life and death. What proof is there that injections of foreign and living elements, though momentarily tolerated and even beneficial in a perspective of

several years, will not ultimately destroy the equilibrium of human cells? And over these considerations floats the shadow of cancer. Niehans regards such timidity with a kind of amused sympathy. They will come around, he believes. It is a question of time.

A habitual criticism concerns the elimination of the injected cells. Though it has been proved that allergic reactions are virtually nonexistent, some doctors still speak of the inevitability of abscess at the injection point. The statistics are quite clear: the appearance of an abscess is extremely rare: once in every 150 injections. Another hostile critic asks for proof that the injected cells are eventually eliminated, that they do not accumulate at the injection point like a kind of parasitical body? At the Heidelberg Cancer Institute, Professor Lettre and his wife demonstrated that the cells deteriorate and rapidly disappear from the injection point, that after several days, only the debris of cells, membranes and nuclei, are found in the region. According to Professor Lettre, in fact, only the mitochondria—constituent elements of the cell—are attracted toward the homologous gland or organ, but this theory has not convinced all concerned. There are still numerous practitioners who believe that the embryonic cells which Niehans uses remain where they are injected, incapable of regeneration and constituting a possible

and dangerous source of infection—or even of cancer. . . .

The adversaries of new cells also point to numerous failures in the method and to a commercialization which they consider disgraceful. Niehans, in recently putting on the market cells preserved by a lyophilization process (vacuum packing), has given his detractors a weapon. There is in such a process a contradiction which few have overlooked. Formerly the embryo cells, in order to achieve their effect, had to be injected immediately upon removal from their place of origin. This was the source of innumerable difficulties. Then, all at once, Niehans launched his ampoules of canned cells! His declaration that he had worked ten years to perfect this process made no difference: every shield was raised. Niehans was accused of having yielded to desire for immense profit. He whose method attacked the whole pharmacopeia, he for whom the word “living” was the key to his entire research, had put himself, by his ampoules, at the mercy of his worst enemies.

The preserved cells were declared not only ineffective but dangerous as well: like the new cells they were accused of transmitting harmful bacteria. Yet the lyophilization process adopted by Niehans after long research subjects living tissues to a temperature of 80° below zero Centigrade and preserves them in

a vacuum. It is not likely that bacteria can survive under these conditions. At Heidelberg, where Niehans himself was in charge of the setting-up of this strange "life cannery," he established an extremely precise apparatus to guarantee the bacteriological sterility of the preserved cells. (Today this security service is under the direction of Professor Dahmen, director of the micro-bacteriological laboratory at the Veterinary Institute of Berlin.) All these precautions were no obstacle to the outburst of protests.

Niehans endured the storm. In Germany, the ampoules became the rage. Despite their high price, nearly a million were sold during the first year.

Meanwhile an event occurred which was to call a temporary halt to the debate. Niehans was summoned to the bedside of the Pope, who was ill.

The Vatican has never published an official version of the Pope's illness of 1954, or of its treatment, or of the circumstances of its cure. The most contradictory rumors have circulated, as if it were Niehans's destiny always to provoke arguments or open conflict wherever he may be. For the general public, Niehans was henceforth the man who had saved the Pope. But controversy soon broke out afresh, this time transcending laboratories and doctors' offices. Specialists were not the only ones to discuss the method: publicized (with a number of errors) by the press, cellular therapy had become famous overnight, competing

with movie stars and bicycle racers in the headlines. Here are a few quotations from the worldwide press, following the Pope's recovery. The original spellings have been respected:

"The cells of Dr. Nieaus: secret weapon against death." (*Le Temps de Paris*)

"In great secrecy, at Castel Gondolfo, Professor Nouans has treated Pius XII with his cell mutations which triumph over all diseases." (*Le Temps de Paris*)

"Cellular therapy guarantees eternal youth: a German chemist, Neaus, makes old men swallow cow embryos." (*Wissen und Leben*, Berlin)

"A Swiss surgeon, Professor Otto Neans, gives placenta injections to his patients. It is this revolutionary technique which has permitted the Pope's cure." (*Povestri Scientifiche*, Bucharest)

"Medical sensation: Niehans' cells prolong life." (*Tenika Moladegi*, Moscow)

"Bulgarian biologist, Niehs, has found the secret of prolonging life by malaxating animal foetuses. Several drops of his solution have snatched the Pope from death . . ." (*Feuille d'Avis de Neuchâtel*)

For thirty years Niehans bore up under hostile criticism and derision, but the difficulties he had over-

come were as nothing in comparison with the ridiculous fame which had descended upon him. He had to flee abroad. When he returned, the public was somewhat calmer, but still just as divided. Since then, the discussion is resumed at each meeting, each gerontological congress. But if Niehans scores points on each occasion, he is also subjected to increasingly severe criticism.

Upon every doctor who has touched the problem of the prolongation of life the same suspicion has weighed. The manufacturers of youth—with their grafts, their “reinvigorating” potions—have all ended in oblivion, even if posterity later rendered them justice.

Niehans is the latest of these savants to date. Like almost all those who have dedicated their lives to the struggle against death, he has created around himself an atmosphere part eager curiosity, part scorn, part jealousy and part hatred. Brown-Séquard came from the island of Mauritius; no one has ever known Voronoff's real name, and his civil status is still undecided. Bogomoletz was discovered in the heart of the Ukraine. Niehans's personality, too, is full of shadows. In his seventies, his appearance of a man of fifty, his gestures, his supple movements, belie his age. His wealth is incalculable; he makes no attempt to conceal the fact. He lives, solitary and apart, in a

silent château, in the intimacy of masterpieces. He rarely receives anyone.

The man who manages to penetrate this seclusion, enters, in the town of Burieh, near Vevey, a setting worthy of Hollywood. The doctor's entrance seems to be planned by a stage director: the visitor, overpowered by the splendor of the place, waits for a long time in a churchlike silence until a faint noise makes him start; a figure appears in a doorway at the head of a tremendous marble staircase. This is the man who has repulsed death itself. How much is natural, how much contrived in this Wagnerian entrance? With Niehans, this is the sort of question one never stops asking. Nothing is clear, indisputable or settled in either the work or the man.

The mystery begins with his own life.

## Niehans's Youth

CONQUERED by the Allies in 1918, Wilhelm II lays down his arms and with a gesture of complete despair cuts off his mustaches.

The proud Kaiser becomes a wrinkled little old man with yellowish teeth; he dresses in a green sack suit and is particularly anxious to conceal his withered arm. The famous pointed helmet gives way to a Tyrolean hat to which the bristling Prussian eagle contributes only one tiny feather. The photograph of the demobilized Wilhelm in *Illustration* was France's finest revenge.

The Kaiser's abdication bears no resemblance to Hitler's apocalyptic disappearance. In 1918, court protocol is faithfully respected; the ruling family takes all the time it needs to reach the château of Doorn, in Holland, where it has chosen to live. A cousin of the Kaiser's even obtains a twelve-hour reprieve in order to finish packing his precious collection of pistols.

This gilded abdication proves that a conquered Germany bears no malice toward its emperor. A few



years later the Republic organizes a referendum to learn whether or not it should indemnify the imperial family. The Germans are unanimous in their approval, so that, by 1933, at the moment Hitler comes to power, the largest landowner in this Republic-without-a-future becomes none other than the famous Kronprinz—former heir to the imperial crown.

The photographs of this period lose a good share of their details in publication. Nevertheless, in those of departure for exile, there appears, not far from the fallen Kaiser, the silhouette of a woman wrapped in a great checked traveling cloak with a kind of riding hood over her head. She seems to be in the picture somewhat by accident, which is the case, for she frequented the court only rarely, having neither friend nor official function there. She is a "neutral" whose Swiss nationality explains her presence in Berlin at this historic moment. She has been entrusted to make certain "family" contacts with cousins in the court of England. Twice she has traveled to London by way of Denmark, protected by her Swiss passport. She is the wife of a surgeon from Berne, Paul Niehans, but she is also the Kaiser's half sister.

Their father, Frederick III, reigned only ninety-nine days, in 1888. Too short a time to accomplish the military exploits he dreamed of. Lacking the power to follow the example of his ancestor, Fred-

erick II, he had to content himself with walking in the footsteps of his chamberlain, the celebrated Baron von Trenck.

A pugnacious giant with bristling mustaches, Trenck collected amorous conquests and duels throughout his life. He died in France—where a last intrigue had led him—under the blade of the guillotine.

The future Frederick III, in his early years, frequently risked death by crossing swords with more than one jealous husband. However, lack of detailed information prevents us from retracing this tumultuous career.

Unlike Napoleon, who left precise data with regard to his gallant enterprises, Frederick took pains to efface, whenever possible, all traces of his presence. The lack of enthusiasm on the part of historians of the period with regard to this prince is significant. He passes through the history of Germany—illuminated as it is with flashes of lightning, thunderclaps of revolutions, murders, conspiracies and schemes of unification—with discretion and modesty; the odor he leaves in his wake is less that of gunpowder than the delicate aroma of lavender.

As a very young man, the future Frederick III falls in love with a middle-class woman of Berlin whose name we do not know. The greatest military achieve-

ments were expected of him, but he dreamed only of this anonymous beauty.

His dreams were realized, for in approximately 1853 a baby girl was born whom the furious King of Prussia immediately sent away to Switzerland to be raised, under the name of Anna Kaufmann, by a family devoted to the Crown. At fifteen she was extremely beautiful, with long blonde hair that fell to her hips, the steel-blue eyes of the Hohenzollerns, a slender waist and shapely legs. Her father, who soon produced other bastards throughout the kingdom, does not seem to have been much interested in her. Other cares preoccupied him: his marriage, for example, to Princess Victoria, sister of Edward VII, King of England. Then the birth of a son—the first legitimate child—the future Kaiser Wilhelm II.

Anna grows up in the peace of Switzerland, convinced that her father is a German diplomat kept far from Europe on some secret mission—and untroubled by the mystery of the comfortable pension which her adoptive parents receive each month. At seventeen, she makes her *début* in society like any well-brought-up young lady of Berne. She has a dress of blue organdy, as well as an elegant and well-born cavalier, whose slender waist, graceful carriage and compliments make quick work of inflaming her young heart.

He asks for her hand. As a young surgeon recently established in Berne, Paul Niehans *père* already enjoys an enviable situation. His forebears have been comfortably established in the city for several generations: it is to them that Madame Kaufmann makes her reply.

Now the cards must be laid on the table. With all due respect, Anna is informed of the secret of her birth. Her father, Frederick III, is dead; her half brother Wilhelm is already ruling Prussia. On the occasion of this proposal of marriage, he has sent by his ambassador, an affectionate letter, a little casket containing jewels, and above all a comfortable dowry with the promise of a regular pension.

Anna, a well-bred girl, weeps to discover that she is the fruit of unconsecrated love and that she will never know her parents; then smiles at the high nobility of her half brother, the Kaiser. The parents of young Niehans, although somewhat astonished, do not make many difficulties. The appearance of a Hohenzollern in the family—even half a Hohenzollern—is still an honor.

As for the young fiancé, quite unaware of this picturesque development, he is in Zürich where his chief has summoned him to assist in the removal of a malignant tumor. Upon his return he learns that his little bride-to-be is of royal blood, that she was as unaware of this as the prettiest fairy-tale heroine,

and that, as in these same stories, the King, her brother, blesses their union and provides them with a considerable income. The first act ends with great emotion.

The King of Prussia's ambassador attends the marriage which assumes a particularly impressive character. The young bride—decked out with ancient jewels, pale behind her veils, her blue eyes still a little frightened at having discovered her past in pledging her future—walks down the cathedral steps to Schubert's music. The wedding guests throw orange flowers. Her husband, the doctor, laced into his frock coat, jabot puffed out over his chest, walks proudly beside her. In his report to the court, the ambassador remarks poetically that a sunbeam—an excellent omen—fell upon the procession as it left the service. On this day, all Berne has eyes only for the seventeen-year-old bride over whom hangs a mystery and the twenty-eight-year-old doctor who has had the good fortune to make her his.

More than thirty years have passed when, around 1917, the God of Battle abandons Prussia. Anna, deeply touched by her half brother's attitude at the time of her marriage, regards it as her duty to assist him now.

Though she had not felt it necessary to leave Switzerland while the Kaiser's armies were imposing their laws upon all Europe, it now occurs to her to

put herself and her Swiss passport at half brother's service. Since she can travel anywhere she likes, she is entrusted with an ultra-secret mission to Paris, to London. . . .

The archives have no word to say about this mission, and no trace of a report has ever been found. Anna Niehans doubtless restrained herself to confiding the results to the discouraged Kaiser in person. We find her beside him at the time of the abdication.

At this period her son, Paul, the future inventor of cellular therapy, is a tall, thin young man with carefully combed blond hair, still hesitating over the choice of a career. His intelligence is exceptional. From his lycée years he astonished his teachers by his abilities and his memory. There exists a letter from one of his mathematics professors of the College de Berne addressed to Dr. Niehans concerning his son: "Gifts of this quality are not often to be met with in a single person. We take the liberty of calling your attention to the importance of encouraging your son to advance as far as possible in the study of mathematics. The power of his imagination can rapidly lead him to the limits of human knowledge."

This model student is not content with being the most brilliant boy in his class; he also excels at shooting, with both revolver and bow and arrow, to such a degree that at the age of only fifteen he represents

the Canton of Berne in the inter-cantonal championship and carries off a victory that fills him with pride. The best shots in Switzerland pay him homage! In a country where shooting is a favorite sport, such results are exceptional.

The following year young Niehans permits himself the luxury of once again trouncing all his adversaries, but this time in the finals of a riding tournament. A young man of excellent family—excelling in everything, in fact—at seventeen he is the cynosure of the middle-class society of Berne. He is unanimously admired, this tall, handsome boy, who is so advanced for his age: an ideal prey for the mothers of Berne, who shamelessly parade their daughters in his path.

But it seems that this high young forehead, crowned with laurels and honored with trophies, harbors only serious thoughts. He dreams of nothing but a military career.

His professors urge him to continue his studies. His father would like him to be a scientist, at least a surgeon like himself. His mother, Anna, deeply moved by her son's religious sensibilities, hopes to make him the Great Pastor of which the Reformation stands in need. She has already had long conversations with him on this subject. At the time he seemed extremely attracted by the pulpit. Suddenly, brutally,

he rouses unanimous opposition by announcing that he has reached a decision: he will make the army his career.

Noisy outbursts are rare in most Protestant families, and in the Niehans family in particular. Yet on this occasion the tone of the discussion rises. Beneath the varnished beams of the comfortable villa outside Berne, before these stiff and severe family portraits, among this dark furniture, these household implements suited to their function, shouts explode like blasphemies. There has never been a concession to caprice in this perfect residence: in the kitchen the astounded servants have stopped their work. . . . Young Master Paul refuses to be won over, and Herr Professor-Doktor is angry! He strides up and down the dining room, his coattails floating behind him. He turns toward his son and tries to reason with him: why will this stubborn young man not try to understand that in Switzerland the army is not a career? That a brilliant boy—whatever his passion for riding—cannot end up as a colonel in some mountain garrison?

The young man seems to yield to these arguments. But his father's relief is of short duration: if the young man cannot join the Swiss Army, he will accept the Kaiser's generous offer—he will go to the officers' school in Potsdam. . . .

Paul refers to a letter received by his mother some



weeks before. Informed of the exceptional gifts, of the academic and sporting triumphs of his nephew, Kaiser Wilhelm II has indicated a hope that this promising young man will serve in a Guards Regiment. Is there any career more attractive for a young man of the nobility who shows such precocious abilities? He has proposed a scholarship at the Cadets Academy.

This time the father's wrath erupts without restraint. Even the Bohemian crystal chandelier trembles. Prussian officer! A fine way of showing his gratitude to Switzerland! The boy's stubbornness is equalled only by his ingratitude.

Anna insists on remaining neutral during this terrible discussion. Despite her admiration for her half brother, Wilhelm II, she does not encourage her son to register in the Cadets Academy; she does not want him to become an officer. She remains faithful to her hopes, and ultimately her gentle obstinacy prevails. Paul will become a pastor. To his father anything would be better than a son in military boots; besides the surgeon considers it politic, for the moment, to ward off the worst. He comes out in favor of the seminary, hoping to resume the discussion later on. The important thing is to root out these war-oriented impulses. . . .

Young Paul Niehans writes his uncle, the Kaiser, a long and studious letter of thanks. Deeply moved by

His Majesty's proposal, he regards himself unworthy of such an honor and, having decided to devote his life to God, humbly asks permission to decline it.

After a vacation, which he spends almost exclusively on horseback, as if he wished to say farewell in the saddle to his dreams of conquest, he enters the theological seminary with great enthusiasm. Here, again, well served by his intelligence and his memory, he breaks all records. In three years he becomes a Doctor of Theology, passes his final examinations with no difficulty, and, somewhat dazzled, finds himself a pastor! Dazzled—and disappointed.

This because his father, meanwhile, has cunningly nurtured a latent taste for medicine, sending him books and familiarizing him with some of his own researches. Paul's open and curious mind has swallowed the bait. And though he dares not confide in his radiantly proud mother, he begins seriously to wonder whether he has chosen the path that suits him best. . . .

At the age of twenty-one, Paul Niehans climbs into the pulpit for the first time. All his masters have come to hear their most gifted pupil's first sermon. A considerable future within the Reformed Church is predicted for him. He preaches, winning tears of emotion and pride from his mother. He receives congratulations with apathy, even boredom: he is

accustomed to immediate success in anything he undertakes.

Not long after this, he replaces a minister in Berne who has fallen ill. Never in the history of the Reformed Church has anyone seen a pastor so young and—it must be confessed—so handsome. The half-darkness of the church, the severe arrangement of the columns, confers a particular aureole upon this young blond giant with the steely eyes, well-trained voice and restrained gestures. It is, therefore, an immense disappointment to the religious circles in Berne when the rumor spreads that the new minister is about to renounce the Church.

This rumor is, however, a fact. The father's plans have triumphed: Paul Niehans is to be a doctor. Many factors have inspired his decision. First of all—although he has never explained himself precisely on this subject—a kind of disappointment; he has reached the end of his studies too quickly. He feels walled in, his intense curiosity cannot accommodate itself to this dead-end science of theology. There are excesses of pride in him: God is not enough. He must yield himself too often. All that he knows leads to what no one knows, and his mind does not accommodate itself gratefully to these perspectives.

We can imagine how great his mother's disappointment must be, but with characteristic firmness, Paul

Niehans knows how to resist the snares of affection. He is adamant. He has made his decision. He begins his medical studies in Berne and then, still following the rhythm he has made his own, he begins his internship in Zurich. A number of doctors his own age have preserved the memory of a student who passed among them like a whirlwind, assimilating every course with unheard-of ease, collecting diplomas, yet whose successes in school do not prevent him from living on a grand scale. He rents an apartment in the old section of Zurich with a terrace overlooking the Limat with its swans. Here he gives many gay parties, which usually end at dawn; he is received in the most elegant salons with as much enthusiasm as in the taverns where he downs one stein of beer after another. He is not only a "dandy," he is, fifty years before the word is invented, Zurich's number-one "playboy," with all the qualities of charm and caprice, all the defects of cynicism which the youth of every generation believes it is discovering in itself. He goes to every ball, causing a sensation at one masquerade by coming as a rectal thermometer. This is one of the rare concessions to the "sawbones" spirit in this theologian who has broken off with the pulpit. He is in too much of a hurry to waste his time with jokes in dubious taste. The same applies to women. He writes his mother that he is being very careful, despite all the nets which the inevitable prospective

mothers-in-law weave around him, not to become officially engaged. He will turn his attentions to resolving this secondary problem later on. This attitude, too, is not without pride.

Now he is a doctor of medicine and determined to explore every divergent path before choosing his field of specialization. Having passed (of course) all the internship requirements, he spends some time at the hospital in Aarau. Dissatisfied with his instructors, he manages to be transferred to his father's service for six months. He absorbs what that has to offer and wishes to see something else. The famous ophthalmologist, Dr. Alfred Vogt, of Zurich, accepts him as an assistant. Six more months suffice to synthesize his knowledge of ophthalmology. "He knows as much as I do," says Vogt, staggered, to his student's father.

Paul Niehans now turns to gynecology, and it is from the most famous gynecologist in Switzerland, Hans Guggisberg, that he acquires his knowledge. He remains in this field, as usual, only the minimum time, and methodically passes on to urology. Hans Wildbolz, the greatest specialist of the period, accepts him on his staff.

One must be rich, gifted and terribly "well-connected" to accomplish such a virtuoso course—to succeed in such a decathlon. In Switzerland and Germany, medicine is as partitioned as it is in France, and controlled by laws just as strict. Turbulent med-

dlers who want to know everything before understanding anything are regarded with no particular favor. Anyone else but Niehans would have broken his neck in a sport so dangerous, but nothing can stop this man. Impelled by an immense feeling of superiority, which he is careful to conceal beneath a deferential curiosity, he surmounts all barriers and rises to the first rank under the noses of stupefied internes impatiently awaiting their own promotions. He has left them far behind, and at the end of two years knows enough to know what he wants to do.

One Saturday in the spring of 1912, his father suggests that they make a little climb up the Oberland. Both are members of the "over 4000 club" (4000 meters) and take their mountain climbing seriously and methodically. Along with archery, mountain climbing is the characteristic pastime of the Swiss citizen. At this period it is practiced in "blossford" trousers, iron-soled boots, and a fur collar. The traditional accessories are field glasses and a canteen of brandy. Father and son alike have a mountain-climbing technique that puts the principal peaks of the Oberland within their reach. In the milk train which slowly carries them up as far as Lauterbrunnen, at the foot of the famous Jungfrau, Paul suddenly declares to his father, "You know, I've made up my mind. I'm going to be a surgeon. . . ." But he does not leave his father time enough to savor his triumph.

"Only," he continues, "I have made another decision as well. . . ." One can expect anything from such a son; Dr. Niehans *père* is resigned. "I want to do my military service!"

As a doctor of medicine, Paul Niehans has the right to request an exemption from military service—which would be automatically granted. This is precisely what he is determined not to do.

"But why?" his father asks. "Why?"

The two men have stepped out of the train. Their eyes sweep over the most beautiful valley of the Oberland, with its snowy peaks and its steep reddish cliff, the thousand-meter wall which no one yet has managed to scale and which, according to the specialists, no one will ever scale: the northern face of the Eiger. Their day's course is more modest. Their usual guide, Peter Gröbl, is waiting for them with the ropes and ice-axes. Gröbl enjoys a great popularity on the Oberland due much less to his exceptional agility on the rocks and in deep snow than to a remarkable capacity for sauerkraut and beer.

"Good weather?"

"Good weather."

Gröbl is not talkative. With his heavy lumbering gait he heads for the Lauberhorn, a great knapsack full of food bouncing over his hips. The two Niehans follow him. There is no talking during a climb: this is one of the laws of the mountain; but at the first stop,

the Professor-Doktor, indifferent for once to the needles of ice that crown the peaks, cannot restrain himself from continuing the discussion: "Will you explain your decision to me?"

Paul has an explanation, but not an easy one. It is this: he has definitively abandoned a military career; no one can doubt that. He has given sufficient proof. Only, he still passionately loves horseback riding . . . and then he feels guilty with regard to someone. . . .

"Guilty?" This time the Professor-Doktor no longer understands a word. "Your mother?"

"No, not my mother. She understands perfectly. You know how easily she puts herself in our place."

"Well then?"

It is his uncle, the Kaiser. Wilhelm II has followed his nephew's career after his refusal to enter the Cadets Academy. Doubtless a trifle vexed, certainly astonished that such an offer should have been rejected, he has regularly corresponded with his half sister. In six months' time he will visit Switzerland as a guest of the army, to observe maneuvers in the Jura. He has calculated that his nephew would, by this time, be under arms. Perhaps he is unaware of the exemption granted to medics. Or perhaps he believes that a Hohenzollern, even when legally authorized to do so, cannot withhold himself from his country's military obligations? In any case, he has expressed the desire to make Paul's acquaintance—



and to have him as his aide-de-camp during the maneuvers. Paul has learned of this project. He has always been deeply grateful for his uncle's attitude toward him and his mother; he admires him; he knows he has wounded him by declining his offer of an opportunity to study at the Cadets Academy and does not feel that he can disappoint him again.

For the doctor this reasoning is not convincing. Such scruples are excessive. The Kaiser has thousands of cadets. His nephew—who is, of course, only his half nephew—certainly does not interest him so much as the latter thinks. . . . But Paul is inflexible, and his decisions are always without appeal.

That evening, exhausted, the three mountain climbers rest in the inn of Lauterbrunnen. The father and son have not reached an understanding. To the elder Niehans the loss of a year at this stage of his son's medical development seems a tremendous error. For a Swiss, the army means nothing; but to Paul, military service has great importance.

What he fears above all is that he might appear ashamed of being the King of Prussia's illegitimate grandson. He wants to affirm his quarter of Hohenzollern blood lest he be suspected of trying to conceal it. His decision is aggressive, like all his decisions.

Pressure is brought to bear on him to make him renounce this notion. The international situation is a dark one. War clouds are gathering over the

Balkans—the year is 1912. Conflict may break out at any moment. Switzerland will then mobilize, and there will still be time to serve. Stubbornly, the young doctor insists on his plans. He enlists, performs his cavalry tasks with such brilliance that he is quickly appointed Sergeant of the Mounted Troops. Photographs of this period reveal a young noncommissioned officer in a kepi, mounting a public stairway in Berne on horseback. His prowess is famous throughout the army. A few days before the beginning of the Jura maneuvers, he receives his commission as second lieutenant and his orders to welcome the Kaiser at the frontier.

Wilhelm II is then at the peak of his glory. Each word of his makes all Europe tremble. The second lieutenant presents himself without timidity to this man before whom the Prussian Marshals stand at attention. The Kaiser, at first surprised by this audacity, ends by according his nephew his friendship. For a week he keeps him at his side.

This duty rendered to his blood—and his own conscience clear—Niehans now thinks only of escaping the hopeless routine of garrison life. His mother, certainly, has appreciated his behavior, although she has refrained from any comment on this subject. His father, still as anti-militaristic as ever, makes a new attempt to win over his son: Now that the latter has paid tribute to this vague sense of guilt, would he

agree to being discharged before his term of service has expired?

The second lieutenant refuses this illegitimate favor. The only concession he permits family influence to obtain for him concerns his next assignment; he has learned that the General Staff is forming a remount mission, destined to go to Germany, Austria, Hungary and neighboring countries to study horses and negotiate sales for the cavalry units. He would like to be a member of this mission; his "qualifications" are indisputable; a "recommendation" would hasten his appointment.

The order arrives, and the detachment leaves Berne for Berlin, which it reaches after twenty days' riding. Niehans is assigned to Vienna for which he sets out—still on horseback—then to Budapest.

There, a Swiss veterinary major, belonging to an extremely rich family, is living on a grand scale. He is soon inviting the young lieutenant to all his soirées. Budapest at this period is one of the many "*petits Paris*" of eastern Europe. Ladies send to the Rue de la Poix for their dresses and hats; saddles and harness are worked by Hermes; gentlemen buy their clothes in Savile Row. In this whirlwind of snobbery, the young half-prince, gay, seductive and tireless, is treated like a king. He breaks hearts and tosses off champagne at six in the morning on the shores of the Danube. His sentimental adventures

lead him far afield. No supper is successful without him and he is consulted before every ball, for no one knows so well as he the complex protocol of royal, imperial and ducal courts.

There are interminable conversations with the major on the traditions of the great German regiments—which Niehans's exceptional memory had recorded when, intending to adopt the profession of arms, he had devoured every book on the armies of Europe. From time to time the two set off on horseback for long forest rides, and certain frivolous young persons who comprise the habitual cast of characters follow in a carriage. In certain clearings beneath the pointed roof of a hunting lodge, the troupe assembles, alights, and dances are improvised, sprinkled with showers of Tokay or French champagne.

Then, suddenly, this operetta no longer pleases him.

Niehans, accustomed to sudden decisions, makes still another. Between one day and the next, he breaks off with this waltzing, bubbling universe. He requests a prolonged leave of absence. All that the astonished major can grant him is a vague study-mission to the Serbian stud farms. It would be useful to know the horse-buying possibilities these remote regions offer. In other words, three months' liberty. Niehans accepts, selects the best horse in the stable,

and one fine morning leaves on a stupendous, solitary expedition.

First he crosses Hungary, then pushes on into the Serbian mountains. When night surprises him on the road, he rolls up inside a heavy Scotch blanket and falls asleep under a tree. In the morning he lights a fire to boil his tea. There are no soldiers in this region: he knocks at farm doors where the peasants generously receive the stranger. Rare breeds of horses are shown him, and he is offered enormous bumpers of slivovitz. He continues on his way. His worn uniform would make his elegant friends back in Budapest tremble. He replaces his tunic by a peasant's heavy canvas jacket. The nights are cool and he buys himself a sheepskin, which he wears over one shoulder by day. Finally, he abandons his Swiss kepi for a wide highlander's cap.

The dashing green hussar has become a kind of sun-tanned Don Quixote with drooping mustaches and dirty boots. He continues his wanderings. In these regions the peasants are so backward that some cannot even tell him whether or not he has crossed the frontier, whether he is still in Serbia or now in Boznia-Herzegovina.

One night, on a farm in the Rila Mountains, as he is preparing to go to sleep, he hears a child moaning. A healer is preparing a brew of herbs. At one glance, Niehans diagnoses the case as acute appen-

dicitis. The nearest hospital is four days' away on horseback. The operation must be performed at once. First he must persuade the parents; negotiate with the healer, who demands a high price to resign his functions for his rival's benefit. Disgusted, Niehans stretches him out with a powerful uppercot and performs the operation with a kitchen knife which he whets himself. . . . Another evening, he opens an abscess in an old woman's throat. She is so poor that she can find nothing in her miserable hut to offer him as a mark of gratitude.

Niehans is happy. All his passions coincide during this solitary cavalcade: he discovers mountains of a wild beauty, he is an officer on a mission—and he performs his duties as a surgeon.

When he returns to Budapest in this strange garb and enters the quartermaster's courtyard on his exhausted Rosinante, the major orders the guard to take aim. He can scarcely discern in this apparition the dashing waltzer he used to know. But Niehans, who does not mind startling his associates, already knows to perfection how to play the man of many faces. He learns with satisfaction that he has been recalled to Switzerland for his discharge. A month later he establishes himself at Clarens, on the shores of Lake Lemán, in offices which his father has bought for him.

In 1913, the entire medical profession is excitedly discussing Alexis Carrel's recent experiments on the adaptive faculties of cells. Wasting no time, Niehans attentively studies these experiments and simultaneously concerns himself with the still-obscure problems of glandular transplants. Brown-Séquard's work has given rise to a whole series of transplant attempts. But Niehans studies in particular the work of the German biologist, Küttner, who instead of transplants has just proposed a repeated "vaccination of important organs." He has made several attempts with thyroid tissue, and certain observations appear encouraging.

Unfortunately, the young doctor has no time to extend his studies further. His father was right: war is declared! And it is in Serbia that the first battles take place; fierce conflicts concerning which one hears only tragic news.

Niehans does not feel he has the right to abandon his friends in the Rila Mountains. Scarcely has he settled in Clarens when he leaves again for Serbia at the head of a Swiss mission, a civilian one this time, and purely medical. The Red Cross has put supplies at his disposal. He himself has raised the complementary funds.

In Belgrade he sets up a model hospital and creates relay-infirmaries on the roads leading to the front.

He treats Serbian, Turkish, Montenegrin and Bulgarian wounded, irrespective of their allegiance. He saves lives by the thousands but must return in haste to Switzerland to recruit doctors and buy supplies. He knows how to plead his cause. . . . In Belgrade once again, he discovers that one of the prisoner-of-war camps on the frontier, Sajkcar, is ravaged by exanthematic typhus. A young doctor recently arrived from Switzerland volunteers to go there at once. Niehans refuses this offer, for he himself is the only man with sufficient experience to deal with problems of this kind. He leaves for Sajkcar, first writing a long letter to his parents, for he estimates his chances of escaping the epidemic at only 20 per cent. The estimates of the Belgrade doctors are still more pessimistic.

The spectacle of Sajkcar is a nightmare. The Serbian Army has dug a moat around the barracks and filled it with water. Soldiers stand guard outside the moat; behind them are emplacements surrounded by barbed wire. A dreamlike silence floats over the camp where seven to eight thousand prisoners are waiting to die. From time to time, there comes a shrill cry, and hovering over all there is a sweetish odor of rot.

The Serbian officer warns: "At the beginning we tried to isolate the sick, but there were revolts. Two of our military orderlies were killed trying to restore



order. These men are savages. . . . Some are Bosnians, some Albanians, and they hate each other: chance alone has united them under the same flag. . . . They don't even know who they're fighting for."

This is true. Bulgarian soldiers, crossing Sofia on the way to the front, had thrown flowers as they passed by the statue of Czar Nicholas, convinced that their army was going to the support of the Russian battalions. And stupefied officers had judged it wiser not to disabuse their men, who were actually going into the line against an enemy they believed they were about to join.

There is nothing surprising in the fact that such oppositions should be manifest in units so curiously brought into battle; and that under enemy fire actual revolts should have occurred. But even if they kill each other, such prisoners are entitled to the aid of the Red Cross. Niehans decides to enter the camp with two orderlies. He is asked to wait for the hour when meals are distributed—which is always the occasion of a veritable carnage. Serbian soldiers arrive with great caldrons bubbling with a thick yellowish soup. The kettles are set on an inclined chute outside the moat and the barbed wire and slid toward the doomed men within. Niehans sees hands grasping long before the kettles disappear at the end of their course in a chorus of screams. . . .

"They're animals," the Serbian commander repeats. "They're not Christians! They'll kill you. . . ."

A revolver in one hand, Niehans crosses the moat.

And the spectacle which awaits him marks him for life: living and dead lie tangled together, and over the heaped-up bodies swagger huge rats with red eyes and sharp teeth. Niehans has to kick them out of the way. The lice are masters here. And in this inferno, men understandably hate each other: formed into distinct and antagonistic groups, they quarrel over the tiniest piece of food, lay traps for each other, exhaust their last strength in insults. . . . Niehans has the courage to begin sorting out the dead. He kills the rats; uses up gallons of disinfectant. His authority is soon recognized. During the night, when he decides to take a little rest outside the camp (the Serbs have built him a little quarantine station in no man's land), wild screams break out. Revolver in hand, Niehans rushes into one of the wards: several patients have already been killed by a giant who is carrying out some mysterious vengeance, and despite Niehans's revolver, the colossus continues his work as though in a dream: he drags each terrified victim from bed, lays him across his knee and with one powerful blow breaks his spinal column!

A week in this inferno plunges Niehans into the

blackest abyss of the human soul. The plague which has fallen upon these men has lowered them to the level of the rats they vie with for scraps, but the anguished doctor, at the limit of his own strength, works at saving them.

He manages to control the epidemic, and finds Serbian volunteers to bury the dead. Soon the Sajakcar camp is out of quarantine. Exhausted, ill—but from nerves, not typhus—Niehans returns to Belgrade. The hospital he has set up is working well and the surgical division also: he decides to report back to Switzerland. Perhaps he is needed elsewhere?

The day before his departure he receives a summons from the Serbian Court. He is astonished to discover a battalion drawn up before the Royal Palace; the men salute. The King has decided to award Niehans the Order of Saint-Sava in recognition of the services he has rendered the country and of his attitude at the front. The aide-de-camp steps out from a group of high officers and formally presents him with the insignia.

Niehans knows that, as an officer of the Swiss Army, he is forbidden to accept any foreign decoration. His action will not be understood, but before these men frozen at attention, these stars, this gold braid, it is impossible to refuse.

He determines, once the ceremony is over, to apply to the Swiss Ambassador, who with all the nec-

essary diplomacy will have the commission annulled. He presents himself, but by the time the Ambassador intervenes, it is too late: the King has set his seal on the parchment, and there exists a Serbian law (as imperative as the Swiss law forbidding officers to be decorated beyond Swiss borders) according to which the Order of Saint-Sava, once bestowed, can under no conditions be revoked or annulled.

Niehans's adventure among the victims of Sajkcar ends in a diplomatic farce. Finally, the Swiss government, to spare the susceptibility of the Serbs, must pass a special decree permitting Lieutenant-Doctor Niehans to belong officially to the Order of the Knights of Saint-Sava. By the time the decree is published, Niehans is thinking of other things. He has scarcely had time to resume the thread of his observations concerning cells and endocrine glands, when the war, whose approach he has long since predicted (he writes several reports to this effect), breaks out all over Europe. Switzerland mobilizes to protect her borders. This time even Niehans's father must take out his old uniform. He meets his son once more, on the General Staff of the First Bernese Brigade. He is astonished to find him dejected, as if terrorized: "But weren't you dreaming of being a soldier not so long ago?"

Paul Niehans does not reply at once. He has seen war—at close quarters. He is one of the few Swiss—

perhaps the only one—to have had this experience. His stories, his reports, cannot do justice to the horror of his recollections.

“I wanted to be a soldier,” he tells his father at last. “Today I thank God I am a surgeon. We are going to be greatly needed.”

It soon becomes evident that the belligerent powers are determined to respect Swiss neutrality. This is a relief, but not for Paul Niehans, whose eyes are still filled with the visions of Sajkcar. Sent home once again, he cannot remain aloof from the conflict. Once more his father appeals to reason: he can be useful in Switzerland, at Red Cross headquarters.

Niehans, stubborn as always, will once again be faithful to himself. He leaves the asylum of neutrality where his compatriots take shelter far from the sound of guns; but it is not to the Kaiser's General Staff in Berlin that he offers his services. That would be too easy. It is unthinkable that he would seek such cheap military glory (at this period, Swiss public opinion believes that the German armies will sweep aside the wretched French redlegs even faster than in 1870). Instead, Niehans decides to go to France!

This time his mother is a little frightened. She yields without trying to understand. She has confidence in her son, perhaps his only fault is that he has too many principles. . . .

For some time Paul has been in correspondence

with Professor Tixier, one of the greatest French surgeons, who works at the Hôtel-Dieu in Lyon. It is to Tixier that he decides to offer his services, and one morning he takes the train for Geneva. Rumors of his departure spread through Clarens; such behavior is not approved. Double-locked in their picturesque little country, incubating their neutrality, the Swiss middle class frown on this excited young man in search of adventure, who cannot resist the orders of a troubled conscience.

*Doctor Niehans*

SCARCELY thirty-three, he is already a Doctor of Theology, Doctor of Medicine, former surgical interne, reserve lieutenant of the Swiss Army, creator of the Serbian Medical Corps, Knight of Saint-Sava, several times winner of Swiss riding contests, and national champion shot.

His medical experience—independent of his theoretical knowledge—is considerable. The Balkan War has given him occasion to treat every kind of wound and perform emergency operations under the most exceptional circumstances. In France no serious work exists on the problems of military surgery. At the Val-de-Grâce Hospital in Paris, relief teams are hastily formed. In the provinces the situation is still more serious: at the Hôtel-Dieu in Lyon, Professor Tixier, who has seen almost all his assistants leave for the front, is overwhelmed with work. He asks in vain for relief, or personnel, and welcomes with open arms this unhopèd-for specialist who has just crossed the Swiss frontier.

Already the first seriously wounded men are arriv-

ing. It is chiefly "skull" cases that are sent to Lyon. At the Hôtel-Dieu operations are performed sixteen hours a day. Niehans works to the point of exhaustion. Drawing on his experience in Serbia, he instructs retired doctors who have resumed service. He, the youngest surgeon of the Hôtel-Dieu—the only young surgeon—has more experience than all the rest together. He is extremely popular until the day the military authorities begin examining his dossier. Their discovery provokes high feelings: the Swiss doctor of the Hôtel-Dieu is a German! He is even the Kaiser's nephew and has served under his orders as *aide-de-camp*! Scandal! Treason! The lamb is a wolf! The neutral Swiss has been wearing the pointed helmet.

His partisans vainly point out that he is saving the lives of wounded French soldiers every day, that his service is gratuitous—that he even pays for his supplies with his own money. . . . Such behavior, the answer comes, is intended to capture French confidence, so that later on the spy will have a free hand to carry out the second part of his plan, which can be nothing less than sending his uncle, the Kaiser, important military secrets of *our army*. And even the fact that he leaves his room only to go to the Hôtel-Dieu is no longer set down to his defense.

The accusations gather force. Niehans is followed by military police. One day, he finds his room in



disorder; his suitcases have been searched, his notes stolen, his medical observations sent to the decoding office. There can be no doubt: these abbreviations conceal information concerning troop movements; these temperature charts are so many specifications about our latest cannons!

It requires all of Tixier's authority and that of his close friend Édouard Herriot, Mayor of Lyon, to end this campaign. The military authorities, however, do not abandon their hostility and regularly demand that this neutral's residence visa be canceled!

In the long run, they find no means of ending the magnificent work of the Hôtel-Dieu except to transfer Tixier to an obscure military hospital. This time no one can, no one will act. Tixier himself refuses to have his orders annulled; he does not want to become a "shirker": he will leave.

Niehans is revolted by this measure. In Lyon, the head surgeon has performed fifteen critical operations every day. What will his role be with a small unit?

The matter is taken up with the young mayor, Édouard Herriot. Quite simply, Niehans is offered Tixier's post at the head of the surgical division. He refuses. An official dinner is arranged for him, but he merely repeats his refusal. His morale is shaken by the campaigns of which he is the victim.

Professor Tixier was his only certain support. With him gone, Niehans foresees that his position will be untenable: "You stay, I stay. You leave and so do I," he tells Tixier.

Tixier leaves, and Niehans as well. He returns to Clarens full of bitterness, though he does not stay there long. Since the French do not want him, he offers his services to the Austrians. He has letters of recommendation from Wilhelm II but is determined not to make use of them. In Vienna, a major in the medical corps receives him ungraciously: "We have no need of assistance. The war will be over in a few days. We accept you *as a favor to you*. . . ."

He is assigned to the service of the great surgeon Von Exner, who scarcely speaks to him and treats him—despite his qualifications and his experience—like one of his twenty-year-old internes. How unlike Tixier's warm friendship! And yet, despite such different beginnings, the situation is to follow the same pattern as in France.

An Austrian counterintelligence officer examines Niehans's dossier. And this time it is his service at the Hôtel-Dieu in Lyon which provokes official outrage. His room is searched, his notes are seized. Obviously they are information as to the movements of Austrian troops, which the descendant of Frederick the Great—O irony!—is about to communicate to his French friends.

And once again the accusation of espionage is launched. Unquestionably, the practice of neutrality is a delicate art in the Europe of 1915.

Fortunately, Exner has recently learned of the situation himself. One day, under his observation, Niehans extracted a bullet from a soldier's spinal column. His skill impresses the chief much less than his use of an unknown instrument: "Where did you get that lancet?"

"From Tixier's service in Lyon."

Niehans tells of his stay there and what he learned. Extremely interested, Exner pays some attention to his interne and when the note from the military authorities arrives, knows enough about him to have the affair dropped. He knows, in particular, the relationship of this "spy" to the Kaiser, but he also knows the dull-witted stubbornness of military authorities: the counterespionage is all-powerful. Despite his desire to keep so valuable an assistant on his staff, he advises him to ask for a transfer to a combat zone. "You will spend a short time there, then I'll recall you and we'll work together again."

Niehans requests the Dolomites front. He is sent to the fortress of Landro, one of the most threatened advance posts of the Austrian lines: here the front thrusts forward into the enemy positions. Such a situation, of course, draws almost continual artillery fire. The officer who hands Niehans his travel orders

(and who probably cannot forgive him his service in a French hospital) declares, "You won't have much work at Landro, doctor. . . ."

"Oh, I thought that there was almost continual shelling. . . ."

"That's what I mean. There's so much shelling there aren't any wounded. Just corpses."

For fifteen days, under fire, Niehans tries to organize a health service. He believes he has succeeded when the general staff decides to abandon the position, now considered "untenable." The Swiss doctor is transferred to an elite battalion—whose mission is to hold at all costs the sector known as the "three battlements." The fighting rages over the slopes of an arid mountain which has changed hands ten times in two months. Niehans sets up his infirmary as near the lines as possible, operating from morning to night. Whenever he has a moment, he heads a patrol that passes beyond the advance post and prowls between the lines looking for wounded.

He is hit twice himself: once on Monte Piano and again, seriously, on the Rauchkogel in the Val de Puster. He has himself cared for hastily and returns to his post as soon as possible.

The Austrian command has been obliged to pay homage to the courage and ability of this "suspicious character." He is now division major and commands the best mobile surgical group at the front. In six-

teen months he officially treats fifteen thousand wounded, though the figure is actually higher, for the official account includes only men registered in the post archives. On days of attack (or retreat) no one bothers with paper work.

This period is extremely important in Niehans's life. He will often refer to it later on in communications with his colleagues. It furnishes him the occasion for critical operations in a limited time and under conditions that are sometimes disastrous.

He makes extremely important observations concerning skull wounds; pursuing his studies of cells and glands, he perceives new relations between the functioning of certain nervous centers and cellular behavior. But above all, he explores all the aspects of death. It is during this period that he learns to consider it not as a fatality, but as a sickness which can be treated and at least temporarily cured. . . . He accumulates records which he will methodically catalogue when the peace-time surgeon replaces the front-lines major.

In 1916, the great Austrian offensives are launched in the southern Dolomites. Lacking supplies and credits, Niehans sends an appeal to his fellow citizens, and the Red Cross sends him aid. Once again he is doing emergency work under enemy fire. Not for long this time: the Swiss General Staff, which has suddenly taken the measure of this reserve lieu-

tenant's astonishing military experience, sends him an urgent recall. He is transferred, with the rank of captain, to a security unit of the frontier. He cannot refuse. He leaves the lines.

On his way back, Niehans passes through an unrecognizable Vienna. The optimistic expectations of the General Staff have not been realized: Europe settles into the war like a patient into his illness, with resignation and humility. Niehans foresees difficult times ahead.

At Berne, in great secrecy, the strategists of the Swiss General Staff interrogate him. Their chief question is: In case of attack, would the Swiss Army as it now stands be in a position to defend the country and repulse any aggressor?

In the light of his experience in the Dolomites, Niehans replies with a categorical "no" which stings the high officers and Colonel Blimps who surround him. "In fifteen days," he specifies, "our men will be disarmed everywhere."

An attitude this decisive, taking no account of the susceptibilities involved, disdaining all respect for hierarchy, provokes the wrath of the General Staff. No one in Berne knows what to do with this young officer whose experience is considerable, but whose remarks are so subversive. He is shut up in an office and given three months to prepare a complete report which will embody his experience, develop

his suggestions and his tactical ideas. No one, however, promises to apply his recommendations. They will be compared with the General Staff's principles; then a decision will be made.

The captain, still under the influence of his recent experiences, prepares a veritable treatise on mountain combat. His conclusions are as precise as those of his oral report: The entire defense position set up by the Swiss strategists will not resist the first attacks of a well-trained army.

Insubordination again!

And this time the generals grow really angry. They have inflicted this heavy task on the troublesome officer only in the secret hope that he would soften his criticism. He has not wanted to understand. A means will be found to put him in his place.

Having no colonies, Switzerland has no extra territorial battalions, but every army has its own "foreign legion": that of the Swiss is on the Italian frontier. To reach it one must leave a zigzag road that climbs to Saint-Gothard, almost at the level of the pass, and march six hours through the snow to find wooden barracks in a desert of rocks beneath an icy wind. There is no possible communication with neighboring posts in case of storm. Niehans is transferred to this outpost, not officially under arrest, but in disgrace. It is hoped that he will be forced to

yield, to recognize the virtues of the preponderant theory. This is to mistake him altogether, to fail to take into account his exceptional will: from his forgotten garrison he sends serious and objective reports while waiting for his hour. It will strike with the next full-scale maneuvers.

The secret instructions he receives call for an attack on a neighboring position. This is a trap: the position in question is reputed to be impregnable. Niehans carefully studies the terrain and draws up a private plan of attack which takes no account of official theory: he will never have a better occasion to demonstrate the value of the practical reforms he advocates.

He launches his attack in the middle of the night. His men, whom he has had time to train, surround the peak and—to the astonishment of the defenders, who had believed themselves secure behind their walls and the guarantees of their military manuals—seize the position. Echoes of the affair reach Berne. The incorrigible captain is recalled. Now he is taken seriously but now it is he who is no longer willing to listen to the officers and strategists. His term of service is over. He is offered an additional rank if he will remain in the service. He refuses.

This is the first time the army has made advances to him; and this is the moment he chooses to renounce his military ambitions for good. He will



never again put on a uniform (except for several days in 1919 when he agrees to head a Red Cross mission to repatriate prisoners interned in Austro-Hungarian camps). His proud character which impelled him with more ardor the more powerful the opposition, now inspires him to change objectives once matters are simplified. Satisfied with having imposed his views and having refused to derive the slightest glory from them, Niehans returns to Clarens, his head full of plans. He has other battles to join, other impregnable positions to seize by arduous combat. For a man like this, there is always something left to conquer.

Above all, he must wash his memory clean of the dreadful images printed upon it. One cannot pass directly from military life to the status of a surgeon, from the Serbian front to the calm of a Swiss villa: Niehans takes a music cure.

Music plays a considerable role in his life: he owes it a great deal. His most original ideas occur to him during concerts, in that rapt somnolence into which he plunges so gladly. Niehans recalls that one winter evening, listening to Beethoven's *Coriolanus Overture* conducted by Munchinger, he realized the essential role of a gland whose functions were extremely obscure at the time—the hypothalamus. For most doctors and anatomists of the period, this gland was only a negligible gray substance at the base of the

brain. Today it is regarded as a kind of headquarters where all the operations assuring the organism's growth and survival are decided. Niehans, ten years ahead of his time, foresees its importance. His thoughts still tend toward the endocrine glands and toward the cells, for it is here that the mysteries of life and death are best approached. He is about to take a tremendous leap in this direction. He wants to know everything that has already been achieved and to push certain experiments further. He sets up a little laboratory at Clarens.

Meanwhile, recollections of the war fade away and the Hohenzollerns have slipped into history.

Niehans, now over forty, has become an extremely sought-after surgeon. He performs operations in all the principal hospitals of Switzerland. At her death, Anna Franziska, his mother, left him a considerable fortune. The excessive pride of his adolescence has abated: he thinks of marriage. In Oxford, England, where he spent a year before the war, he had made the acquaintance of a young lady whose image has dimly persisted through all the upheavals of his subsequent life. He has seen her again in Zürich fairly recently during one of the Winterthur Orchestra concerts. Her name is Coralie Marsh and Paul Niehans will marry her in 1923. Coralie Marsh comes from a family of British men-of-law. Blonde and elegant, she enters the life of this authoritarian

man—though from the earliest years of her marriage she plays a secondary role which is still hers today. She is to bear no children; nothing is known about her save the fact that she collects records enthusiastically and is herself a pianist of great talent. Visitors see her only rarely.

By 1925, Paul Niehans is one of the most skillful glandular surgeons in Europe. His operating technique is complemented by a remarkable knowledge of theory. The first of his important works, which brings him to the attention of the entire medical world, concerns the pituitary gland.

This is known as a "principal endocrine gland" although it is a little smaller than a cherry and its weight varies from .4 to 8 grams. Niehans observes that the pituitary is found in all vertebrates, including the simplest fish—and that even in the central position which it generally occupies, it is generally protected by a bony shell. To enjoy such protection, he decides, the pituitary gland must have important tasks.

At the time, no one knows what they are. Niehans's work, *The Endocrine Glands of the Brain*, gives a hint to a number of investigators: twenty-four hormones are now known to be secreted by the pituitary gland into the blood, assuring the equilibrium of the entire endocrine system. The first of Niehans's studies enable him to realize that pituitary trans-

plants would affect the growth of individuals. Dwarfism, for instance, is very frequently the consequence of a pituitary disturbance.

Niehans makes his first pituitary experiment on a stunted eighteen-year-old male, four feet high.

In several months the patient, whose height has been stabilized for over five years, begins to grow. A year later he is five feet tall. Will he continue and pass this height? For a moment Niehans believes he will and is seized with panic: the "dwarf" is now five feet two inches tall and is perhaps tending toward a gigantism equally catastrophic. But suddenly he stops growing and his height is stabilized.

This is the first time that a pituitary transplant has been performed on a human being. It is also the first time that the action of an endocrine gland has been demonstrated with such precision. Henceforth, Niehans will increase such transplants. As a mountain climber collects his "Grandes Premières," he will perform innumerable glandular grafts hitherto unheard of.

To an obese patient about four and a half feet high, Niehans gives injections of pituitary hormones mixed with testicle cells: in less than a year the patient's weight is reduced and he is five feet tall.

When, in 1937, Niehans decides to visit the United States, the rumor spreads—as a result of these treatments—that Niehans can, at will, make

dwarfs grow or giants shrink (certain gigantisms are, in fact, of pituitary origin). And one morning Niehans finds a dwarf knocking at the door of his New York hotel, pleading to be allowed to buy a drop of the magical potion.

But each treatment of this kind, if it is possible at all, must be preceded by long and scrupulous examinations (including the famous Abderhalden test which at the time was used only in Basel). Niehans sends the patient away.

The next day three more dwarfs appear—and a giant as well—whom Niehans must dismiss. The hotel manager begins to be concerned. The following day a strange procession of twenty-five dwarfs, four giants and other deformed people makes its way to his apartment. Niehans even finds one of these unfortunate creatures on his balcony. This time the manager grows annoyed: "If you're hiring freaks for your circus, make your appointments elsewhere. How do you think this parade of monsters affects our guests?"

Niehans protests that he can do nothing about it, a journalist having unfortunately announced that the doctor is capable of stretching and shrinking human height at will. He offers to move out.

There is no other solution. But the monsters do not take long to track him down. Their troupe has increased now by several hundred freaks of nature,

hysterical at the thought that a miraculous doctor from Europe is in New York with a secret potion that can restore their normal height and appearance.

Niehans is traced to his small hotel on Fifty-fifth Street, and this time the entire building is assaulted by a horde of frenzied dwarfs and giants. Several tenants faint with terror. The police do not know how to deal with such desperadoes. Barricaded in his room, the telephone cut, Niehans, terrorized, waits for someone to deliver him.

This episode enlightens him as to the harm that can be done by a single newspaper article when it is inaccurately worded. It also confirms his decision to keep to the realm of pure research. His studies of cancer are already far advanced, but he "publishes" as little as possible. Similarly, he keeps secret his revitalization treatments. By 1920, Niehans is the only surgeon in the world to succeed with organ transplants. This is still not a question of cellular therapy, for the glands are not yet pulverized and injected. A gland taken from a young animal is grafted in place of the one whose functioning is inadequate. Cellular therapy in its modern form does not yet exist. It will be born by accident.

In a Lausanne clinic, a young surgeon performing a goiter operation makes an incision a few millimetres too deep and removes not only the thyroid gland as he intended, but also a portion of the para-

thyroids, causing extremely serious damage: every first-year medical student knows that a human being cannot live more than a few hours when the parathyroids cease functioning. This clumsiness will have many consequences.

Beside himself, the surgeon calls in Dr. de Quervain, director of the clinic. The latter is categorical: there is only one hope—grafting.

At the time (1931), the complex problems of grafting animal glands on human beings are still unexplored. Nevertheless, recent communications indicate success percentages far above what has been previously recorded. The clinic's director suddenly remembers a work which has just aroused specialists everywhere. Its author, Niehans, lives in Montreux. He must be reached at all costs.

He is not at home, nor with any of the three patients to whom his nurse, consulting the appointment book, refers the director. An hour passes and the patient is now writhing in increasingly frequent tetanus cramps. Finally Niehans is found: "The patient is in the middle of a tetanus attack. . . . Can you attempt a transplant?"

"How long since the accident?"

"Twenty-four minutes. . . ."

"I'll be there."

Dropping everything, Niehans drives to the Clarens slaughterhouse where the animals he uses

for his experiments are kept. He removes the parathyroid glands from a steer and races to the clinic.

A dramatic tension fills the air. Everyone in the hospital knows what has happened except members of the patient's family, who are confidently reading magazines in the waiting room.

Niehans is at the patient's bedside. A swift examination confirms his fears. At any moment, a violent spasm may provoke death; an orthodox transplant offers no hope. Even on a quiescent patient at least ten hours are required to perform this delicate graft. Niehans raises his head, his eyes meet those of the young surgeon.

"Something awakened within me," Niehans remarked much later during a lecture. "Even in a desperate case the practitioner's will to save his patient must never weaken. I had a kind of inspiration. . . ."

Under the eyes of the stupefied onlookers, he begins cutting the precious steer gland, snipping it into tiny pieces with a pair of scissors. He asks for a physiological solution with which he fills a large hypodermic syringe. He mixes the slivers of the gland in this liquid and injects this preparation into the dying patient's pectoral muscle.

Dr. de Quervain recoils in terror. The official thesis prevalent at the time holds that the injection of foreign albumens produces a dangerous, some-



times a mortal shock. To the director of the clinic, this spur-of-the-moment treatment has wiped out the patient's last chances of survival.

Two hours of great anguish pass. The cramps, which diminished in intensity immediately after the injection, have almost completely stopped. The patient seems out of danger: the doctors in attendance are obliged to admit that the preparation is either a substitute for the damaged parathyroids or stimulated their functioning. The indispensable hormone—one cannot doubt the fact—is once again being secreted in the organism. For how long will this amelioration manifest itself? Will the tetanus not strike again? During the next few days, wondering and worried, Niehans and the surgeon watch the patient for signs of a relapse; they do not appear. Cellular therapy has been born!

Henceforth, all Niehans's efforts will tend in this direction alone. He will work twenty years, twelve hours a day, to perfect his discovery. At the beginning, only a few friends will be informed of his work. He will surround himself with a wall of silence.

Rumors, however, leak out to the medical milieu. One day Niehans is summoned to London on a consultation. The physicians of King George VI, who is afflicted with arteritis, wished to know Niehans's ideas on this subject. Protocol forbids a King of England to submit to auscultation by a foreigner,

but the difficulty is evaded and Niehans gives his opinion. He has already successfully treated peripheral circulatory disturbances similar to those from which the King is currently suffering. In almost every case, arteretis of the lower limbs has been reduced; amputations have been avoided; gangrenes have disappeared. Generally, he has injected placenta, liver and spleen taken from embryos, but these treatments are still extremely recent; they seem too daring to the British doctors.

Soon after this, however, another sovereign, the Rajah of Darbhanga, will be the first of Niehans's famous patients.

He is one of India's most powerful princes, but he is also one of the most unhappy: at only fifty he claims to have lost the will to live. The most skilled physicians have served at his bedside where, supine on precious silks, among the rarest furs, he remains plunged in a kind of definitive torpor. Even the sight of the jewel caskets his beautiful servants bring him each morning does not bring him out of his melancholy. Nothing can awaken a flicker of interest in his weary eyes.

For two years he has complained of pains around his heart. He is afflicted with dizzy spells that occasionally become fainting fits. Yet the electrocardiograms which each successive doctor has taken show the patient to be perfectly normal.

When Niehans, surrounded by turbaned guards armed with sabers, crosses the immense, silent halls of a palace out of the Arabian nights, he foresees that he is going to be confronted with a classic case of "neuro-vegetative dystonia." This is an affliction widespread among those who *have everything*. There is nothing left to desire, not even life itself. He has already encountered several of these gilded wrecks, whining, pathetic, always complaining of the same exhaustion, depression, inexplicable headaches, dizzy spells. Ordinarily, this cocktail of *ennui* also includes insomnia and impotence.

The Rajah fits such a category perfectly. Upon Niehans's arrival he does not even turn his head and continues mechanically caressing a Persian cat. Since it is forbidden to speak to His Highness first, visitors may wait an hour, motionless, until he deigns to notice their presence.

Almost at once, a dozen lackeys appear with a sumptuous meal. The melancholy prince rejects the silver-gilt platters without even looking at them. He tosses a piece of chicken to his jaguar. Doubtless satiated, the latter does not even turn its head. The Rajah glances at the doctor and says in English, "My disease is contagious! Even the jaguar has lost his appetite."

An examination proves that the patient's organism is in excellent health. Niehans decides to inject

cells from the placenta and the sexual glands. He would use other cells had some important organ been damaged. There can be no question, in this country where the languishing Rajah has only the sacred cows for rivals, of injecting the former with the cells taken from the latter. Niehans has great difficulty discovering a sheep conforming to the requisite standards of laboratory control. The Rajah's Hindu healers consider these preliminaries calmly. They have long known the power of the endocrine glands; their patron, the famous Susruta, fourteen hundred years before Jesus Christ, had ground up the sexual glands of young tigers and made a broth of them, which he administered to patients suffering from impotence; he also recommended the human placenta as a tonic, for he had been the first to notice that the baboon eats its own placenta during the twenty or thirty minutes after it has given birth and will not be distracted from this meal even for the most tempting delicacies.

The healers, in fact, are more interested than the Rajah in Niehans's preparatory work. The doctor is requested to remain in the palace until the first symptoms of improvement appear. He is treated like a prince, but during his walks outside the palace he discovers that two guards follow him everywhere. When he asks the reason for this surveillance, he is informed that it is to prevent any attempt at flight.

"The last magician," he is told, "the one who burnt herbs, realizing that his treatment was having no effect, managed to escape!"

"Escape? Then he was being kept a prisoner?"

"Of course!"

"But why?"

"To cut off his head, in case he failed. . . ."

Niehans is well aware that certain kinds of asthenia may resist injections. Fortunately, at the end of three weeks, a certain improvement is evident. His Highness, like the sleeping beauty, seems to emerge from his lethargy, recovers a little appetite, and enough interest in life to have a certain number of political prisoners executed on the spot. Without attempting to extend his study of this case or to confirm the success of his treatment over a longer period, Niehans takes his leave, having received in payment a handful of precious stones!

He now definitively abandons surgical transplants in favor of his *injections*.

"It is only after having obtained no reaction following more than a hundred injections of parathyroid or placenta cells," he writes, "that I began practicing cellular injections from other organs as well. By now I have performed cellular injections from almost every organ and discovered that a sick organism needing young cells to assure its cure receives them remarkably well. Thus even numerous

intra-muscular injections are admirably supported by small children or old people without pain, fever, or swelling."

At the time, the great masters of medicine refuse to believe in this lack of reaction. A German doctor from Berlin who has learned of Niehans's work even comes to Clarens without warning to check the authenticity of his information. Niehans is treating a Mongoloid child. The professor watches all phases of the operation. When the moment for the tiny patient's injection arrives and he sees Niehans preparing the syringe, he takes his arm, saying: "If I had the power to do it, I would have you arrested!"

Niehans performs the injection.

The German doctor, whose experience in cases of anaphylaxis covers more than a quarter of a century, has taken out his watch. No reaction shock occurs, of course. Between 1930 and 1939 this scene is often repeated, always to the great astonishment of the specialists.

Each time, Niehans emphasizes the necessity of injecting *indispensable* cells.

Since 1909, it has been recognized that the mechanism of immunization does not function when the organism requires a transplant. Everything occurs as if the body, which as a rule violently protests against all superfluous albumen, receives gratefully the cells it actually needs. In certain cases of pro-

nounced disposition to allergy, Niehans proposes first injecting an extremely weak portion of the cellular solution beneath the skin. He waits approximately half an hour. If no reaction is determined, the injection may proceed. . . .

Parallel to Niehans's researches, the science of hormones was being developed, a substitution therapy which was reaching maturity at the same time as cellular therapy.

Niehans believed then—and still does—that new cells are more valuable than hormones in injections, for their effects are much more prolonged.

He does not contest the effects of industrial and synthetic hormones, of crystallized hormones for implantation: he merely takes exception to their temporary effect. For he is now in a position to present a complete dossier in which certain observations extend over a period of more than ten years. He is sure of his results, sure of being able to offer humanity a revolutionary therapy promising spectacular cures, the revitalization of prematurely weakened organisms; also permitting the postponement of senescence and, in many cases, of death itself.

We are in the year 1939. In Germany, Hitler has completed the preparation of his extermination experiments. For ten years the value of human life will lower at a regular rate. Who would dare speak

of rejuvenation at a moment when, for many, merely to survive is a stupendous feat?

Niehans patiently continues to catalogue his files, to "follow" the continuing improvements of patients injected in 1931, 1932 or 1933. He works on animals, with tissue cultures. He attacks the problem of cancer, with the help of Dr. Pischinger. In his laboratory at Clarens, with the assistance of Karl-Friedrich Bower, he begins research on a process for preserving cells. Their first idea is to put the new cells on ice: the congealing of spermatozoöns from healthy animals, for instance, does not affect their fecundation capacity. Niehans injects himself with the frozen preparation. He is immediately seized with violent attacks and must remain in bed for several days. But this failure does not discourage him. He believes that there must exist a means of preserving the cells. He tries several processes.

Today, ampoules of cells preserved and guaranteed by Niehans are sold in every pharmacy of Germany, Switzerland, and the other countries where their sale is authorized (France and the United States, among others, having opposed them). They must nevertheless be injected by a doctor. Under the name "Sicczellen," these preserved cells constitute a considerable commercial undertaking which has put weapons in the hands of Niehans's adversaries.

As to the effectiveness of the "canned" cells, Nie-



hans is categorical. They are virtually as effective as fresh cells. (This "virtually," provokes a certain amount of doubt.)

The cells are aseptically taken from animals under laboratory control after serological tests. They are quickly frozen to 70 or 80 degrees below zero (Centigrade); then their water content is extracted by dehydration within a nearly perfect vacuum. In the last step, the different organs are powdered, placed in sterile ampoules, and vacuum sealed. Each ampoule contains only cells from a single organ.

The doctor injecting the cells must take certain precautions: opening the ampoule only immediately before its utilization, he must place it in Ringer's solution inside his syringe.

The ampoules retain their effectiveness for a year. The "canned" cells were put on the market only after six thousand injections without incident and a closely controlled check of results. Nevertheless, certain of Niehans's adversaries, who had already attacked the injection of new cells, believed this "quack powder" had provided them with a decisive argument. It seems, however, that Niehans has once again succeeded in imposing his views.

In serious cases the injection of new cells is still preferable. But sometimes hospitalization is not feasible. In such cases, treatment at home can produce the same effects. While the Pope received injec-

tions of new cells, Chancellor Adenauer, because of the demands of his electoral campaign, has had to content himself with cells from ampoules. According to certain rumors, Churchill has also been a regular consumer; another rumor has been current in Switzerland lately though never confirmed: Churchill has had to rely on dry cells because Niehans refuses to give him new ones. The inventor of cellular therapy, it is said, has never forgiven the British diplomat for his share in the partition of Germany.

When Niehans visited Japan in the summer of 1956, he was astonished by the warm welcome he received. His ampoules had preceded him there, and certain hospitals have since set up research laboratories to study cellular therapy.

Niehans compares their results with his own; he also directs cancer research in several Swiss laboratories, surrounded by absolute secrecy.

Ever since the Pope's illness put him, against his will, in the headlines of the world's press, he has lived on the defensive. In Burieh-Vevey, just outside of Montreux, he occupies a magnificent stone mansion which he bought in 1937, five minutes' walk from his clinic along a magnificent *allée* of cypress trees.

An old servant manipulates the complicated lock of a massive door and precedes the visitor into a hall of imposing proportions which opens onto the liv-

ing room. This is a kind of tremendous roofed terrace with many bay windows overlooking Lake Lemman. If it is true that in our era of overpopulation, luxury is space, then this residence is the height of luxury: in this tremendous room, created for crowds or assemblies, the solitary visitor is not in the right scale. Everything is too big for him: the rare paintings, the precious objects; at the other end of the room, a monumental carved Renaissance sideboard must have been created for some castle armory. In a moment Niehans will appear between those giant *épées*, survivors of the Crusades, coveted by the Museum of Zurich. Everything is too big, and too far away. It takes the visitor a few moments to discover the reason for his discomfort. The chairs are arranged so that no conversation between occupants would be possible. And as he realizes that this house has nothing domestic about it, he suddenly turns around, no sound has warned him of another presence.

Niehans is standing at the head of the stairs, his penetrating eyes fixed on the visitor. His long silhouette is framed in the doorway. He is wearing an old-fashioned black suit with a hard collar, a gray tie. His silvered hair is stiff and flat against his head. His gait is supple: those who do not know his age (seventy-six at the time of my interview, since he was born in 1882), must imagine he is perhaps fifty.

The deeply etched lines and the dark circles beneath the eyes are the only signs of his true age.

He comes down the stairs, approaches, bows his head and greets me in excellent French (he speaks German, English, Italian and French with the same facility, Spanish somewhat less fluently). First of all he explains why he has made it a rule not to grant interviews to journalists. He is on bad terms, he says, with the Swiss Medical Association, which regards the numerous articles appearing on cellular therapy with extreme disfavor. The Order of Swiss Physicians absolutely forbids its members to make statements to the press. In principle, any connection between physicians and journalists must be submitted to the presiding council.

"But what can I do?" Niehans asks. "The reporters do not ask my permission to write their articles, so sometimes it is preferable to guide them!

"All my life," he adds, "I've struggled to have my studies on new cells communicated only to doctors and specialists. I have never written articles or books for the public at large. I have never spoken except before professional colleagues. [With one exception: a lecture to the Society of Natural History in Soleure, Switzerland, on January 3, 1955.] And then suddenly this veil was torn away and my cells have fallen into the public domain! Is it fair that I should be reproached for this?"

Niehans takes a few steps, glances at his favorite painting, a Duccio Madonna, and then, as if pacified by the sight, turns to a chair. . . .

We are sitting across from each other at a tremendous table of pale wood; it is five in the afternoon and winter darkness has fallen over the park. Through the large bay windows the gentle slope down to the lake shimmers under a thin film of snow.

"Doctor Niehans, I know your time is precious and I won't ask you to explain the major phases of your method, for they are well known. I should like to ask you three questions. The first concerns your vacuum-packed "canned" cells, whose effectiveness has been contested."

"Such maneuvers are shameful!" the doctor replies. "I have obtained excellent results; countless doctors have sent me their results!"

Niehans takes from a cupboard a box of ampoules containing white powder. "This year three hundred thousand injections of these cells have been made the world over; only a doctor, you know, is qualified to perform these injections. The statistics are excellent. . . ."

The cell powder is manufactured under state control by the Rhein Chemi Company of Heidelberg (Germany) and sold by the Pharmakon Company of Zurich. Prices vary according to countries. In Switzerland a box of six ampoules costs 80 francs (\$5).

Neither France nor the United States have opened their borders to these cells.

"My second question, Doctor Niehans, is this: how do you explain the fact that official medical opposition to your discoveries is still so pronounced in France and the United States?"

"This opposition is lessening daily," Niehans replies. "I continually receive letters from doctors who do not hesitate to defy the officials—and to apply cellular therapy on their own initiative. Just recently, a center for cellular-therapy research has been opened in the United States. But I am aware that general opinion is against me. Why? It would take too long to explain in detail. What you should know is that it is, unfortunately, commercial considerations which most often cause difficulties."

"Doctor Niehans, this is my last question: in which diseases have you obtained the best results by the injection of new cells?"

"First of all, in the deficient functioning of organs—particularly the endocrine glands. How many mothers who have given birth to a Mongoloid child have rejoiced at seeing the results, after thymus-thyroid- and pituitary-cell injections? How many retarded infants have been wakened to life with cells from the thyroid gland and the frontal lobe!

"Further, take the case of pubertal derangements:

two years ago, in fact, I was visited by a mother in despair; her daughter, until the onset of puberty, had been a gay, good-tempered child. But her expected periods did not occur, and the girl's temperament underwent a change. She would shut herself in her room, where she emptied and filled her cupboard all day long. I injected ovary cells, and in two months the girl emerged from her nightmare. She has since married . . . and recently gave birth to a magnificent child. . . ."

"I am also reminded," Niehans continues, "of the spectacular results of cellular therapy in cases of sexual abnormality. I inject ovary cells in Lesbian cases; and instead of punishing those unfortunate male homosexuals whose practices are in conflict with the law, it is my opinion that they should be given testicle cells."

Niehans is now speaking rapidly, with concentration, as if he were addressing a large audience. His tone is ardent and intense. It is obvious that he wishes to be convincing:

"I have had remarkable results in cases of weakness, after difficult childbirth—or serious illness. . . . How strange a thing instinct is, formed by nature in the course of millions of years. In the animal world, the mother obeys a mysterious power when, after having given birth, she devours her own placenta,

so rich in cells. After a difficult childbirth, the human mother should be given placenta cells. The same applies to patients exhausted by disease.

"In anemia cases, or after a heavy loss of blood, cells from the bone marrow and foetal liver can put a patient on the road to recovery. Innumerable ailments are within the powers of cellular therapy. Kidney diseases have been treated with astonishing success. Serious nephrosis disappears after injection of renal cells. In cases of diabetes insipidus the patient suffers from continual thirst and often drinks as much as fifteen quarts of water a day. . . . I inject cells from the posterior lobe of the pituitary gland—and *in most cases* the thirst disappears. You have to see one of these sufferers emerge from his liquid hell to realize the splendor of our profession. . . ."

Doctor Niehans pauses for a moment as if he wished to collect his thoughts. I had not hoped to hear the creator of cellular therapy sum up his experiments for me—and give me so complete a résumé of his method. I hastily take down his words in my notebook.

"The diseases of blood circulation," he continues, "are *often* favorably affected by cellular therapy. In arteritis, the pain is extreme and the blood no longer circulates. What has happened? The arteries have degenerated under the effect of an inflammation accompanied by spasms. What is to be done? In the



growing foetus, the placenta is still forming new capillaries which irrigate the entire organism and become blood vessels—precisely what the patient needs. . . . We therefore inject placenta cells! To combat arterial degeneration, we inject cells from the foetal spleen, the foetal liver, and from the walls of the foetal vessels. If necessary, we also inject cells from the foetal heart and from the sexual gland. . . .

“What a joy to ascertain that, *for the most part*, the shrunken arteries gradually dilate and that the circulation slowly becomes normal in the limbs. How many legs we have saved by this treatment—how many amputations have been avoided. . . !”

Doctor Niehans gestures as if he were sweeping away all the secondary considerations of his method, determined to speak only of primary principles.

“Consider further,” he says, “liver afflictions cured at their inception, in astonishingly short order, by injections of foetal liver cells. Injections of bone-marrow cells have a positive action on diseases due to radioactivity. In Japan experiments were performed on the victims of the atomic bomb with positive results . . . and consider the *superb* results obtained in treatments of Ménière’s disease, which involves such terrible dizzy spells! And those we are obtaining in our treatment of the famous ‘Manager Disease.’ The human motor runs too fast; at the first danger signals (irregular heartbeats, dizzy

spells), I recommend cell injections. Who knows how many accidents we have avoided?

"I also prescribe cells at the period of menopause, when the human organism is the theatre of a veritable internal revolution. The signs are well known: in men, when the hypertrophy of the prostate gland obliges frequent urination; under cellular therapy relief is *virtually* certain.

". . . And then"—the doctor stood up—"and then the end of life approaches. The heart, which has beat so long, is tired. . . . Its muscle is weakened! Why not provide it with cardiac-muscle cells to fortify it? The intellectual faculties diminish, the central nervous system, which is so delicate, deteriorates. . . . Has not Carrel proved that deteriorating cell cultures are revived by the influx of new cells? Therefore, why refuse this gift to the exhausted, the depressed, to all those whose physical and intellectual faculties are weakened?"

The darkness has now covered the entire park, stretching great veils of black crepe outside the bay windows. The doctor has not turned on any lights, and the tremendous room is plunged in shadow. Still the same silence, which makes Niehans's penetrating voice echo all the louder. "It is time for my visit to my clinic," he says. Before leaving the villa, a last glance at his masterpieces. Niehans turns on the light over the Van Dyck, then over the magnifi-

cent Italian Madonna. He casts another loving glance at her: "Experts from Milan came to study her," he says, and adds: "She was a present from a patient—very famous, very rich. And cured!"

Outside, it has grown cold. I raise my raincoat collar. Niehans wears neither hat nor coat. "Aren't you cold?"

"Cold? I give myself suprarenal gland injections in winter!"

As we pass a sort of shed, Niehans says, "Come in; I keep boarders here. . . ." He refers to his peacocks, which he raises as a hobby. They, too, are particular favorites, and he passes along the pens, distributing friendly caresses. The peacock, in ancient times, was a symbol of immortality, and mention of this belief occurs in Saint Augustine's works; it occurred to me later how curious it is Niehans should keep only these birds which according to our ancestors never died. I risk a question: "Have you tried cells on animals?"

"Not on peacocks," Niehans replies. "But in 1956, I was called into consultation about a celebrated patient. I injected new cells . . . and he was cured. It was the leopard of the Zurich zoo!"

We walk down a cypress *allée*, paved with fine sand. . . . "But surely, Doctor Niehans, those who refuse to admit that your cells cure—that they rejuvenate—such persistent adversaries do not *all*

have interests in the great pharmaceutical firms. . . . Have you any loyal enemies?"

Niehans makes a sweeping gesture to indicate that he has nothing more to say on this subject. "I cure. That is all."

We have reached the road near the Montreux bus stop. The doctor says good-bye and walks into the icy darkness, strangely indifferent to it, swinging his arms vigorously. His tall figure, caught for a moment in the passing headlights, projects a tremendous shadow on the road ahead.

PART II

*The Trial of  
Cellular Therapy*



## *The Case for the Defense*

THE first witness is almost ninety years old today!

She is the patient from the clinic in Lausanne to whom, in 1931, Niehans administered his first injection of cellular solution. It was not very long ago that she learned of the remarkable circumstances of her recovery. She manifested neither surprise nor interest in this subject and remembered only a few painful cramps upon awakening. She lives in a tiny apartment in Montreux, leading a modest, retired life, doing her own housework and going to market every day in all weather. In her room, the walls are covered with ancient photographs; the old lady is alone now, all her relatives are dead, even her only child. She knits big black sweaters for charity all day long, listening to Radio-Lausanne. She has never quite understood—although she has been told the story of her treatment—why, for some years now, doctors and journalists come so frequently to visit

her. Whatever is said to her (or whatever she is made to say), she will never admit that twenty-five years earlier she was the first beneficiary of the most controversial therapy of our times.

For the debate lasted twenty-five years. Yet if adversaries and partisans of new cells still confront each other with the same fierceness, the tone of the discussion underwent a change four years ago.

Niehans made his debut before the general public in 1954 as the man who saved the Pope. Some refuse him the honor of this spectacular cure; but the evidence indicates that it can be set down to his account.

Once more chance influences events. A German friend asks Niehans and his wife to accompany him to Rome where he has been invited to exercise his talents. This is no ordinary friend—once before, he appeared, in strange circumstances: in May, 1945, exhausted, terrified, huddled in a raincoat far too big for him, he had rung at the clinic's door. The nurse on duty had opened the door, then hurriedly closed it again. The war was over and with it, for the Swiss, the time of adventure. There were no more refugees clustered at the nearby frontiers, no more escaped prisoners of war, no more politicians claiming sanctuary. All was being restored to order—God be thanked—and peaceful Switzerland was resuming the placid routine of an orderly country



where men and affairs are never out of place, and where the taxpayers would feel themselves personally responsible for a tramp, should such a creature exist.

But, indeed, the visitor resembled a tramp, emerging out of the night poorly dressed, trembling with fatigue, with neither car nor suitcase. And filthy. He rang again, and in French tinged with a German accent, asked for Doctor Niehans.

"Whom shall I say——?"

"Say, a friend of John Knittel."

The author of *Via Mala* and *Thérèse Étienne* was well known in the clinic, but this strange introduction puzzled the nurse.

"But what's your name?"

"I can't tell you. Please hurry."

There was a ring of authority in this voice. The nurse picked up the telephone. The doctor, who had left the clinic for his own house some four hundred yards away, returned. He found the stranger waiting for him on the doorstep. He had never met him, but despite his gray beard, his fatigue, and his open collar, Niehans recognized at once one of the greatest musicians of the period, Wilhelm Furtwängler.

Pursued by the American military police for his supposed pro-Nazi activities (time was to show the

excessive violence of these accusations), Furtwängler had been obliged to flee. An American officer had given him this advice: in the present atmosphere, the worst misfortunes lay in wait for him if he remained in Germany. He had managed to cross the frontier, slipping through various police networks. But the Swiss police, alerted by the American authorities, had picked up his tracks. Then he had remembered a trip he had made with Knittel, in 1936, to Africa. One night in Kenya, his friend, the novelist, had mentioned a certain Doctor Niehans, whose work on new cells he was interested in. Knittel had praised the surgeon's medical abilities, his profound love of music, and his wide human experience. Reaching Lausanne, Furtwängler had sensed the police net closing around him, had slept one night in the station, and no longer knew where to go. . . .

He remained a year and a half with Dr. Niehans.

Restored by a month's stay in the clinic—where he doubtless received cell injections—Furtwängler rapidly became an intimate of the villa, spending long days with Madame Niehans, whose musical knowledge is considerable. As he recovered his spirits, he composed his Third Symphony. In 1947, he was able to negotiate his return to Germany, but he never forgot Niehans and his wife, to whom he paid frequent visits. And when, in 1956, he was in-

vited to direct a Wagner Festival in Rome, he quite naturally asked his friends to accompany him.

The first concert was broadcast directly by the Italian radio. The Pope was listening. He greatly enjoyed the interpretation and granted the conductor a private audience. During the course of the interview, Furtwängler, struck by the extreme pertinence of the Pontiff's musical comments, felt he must risk a compliment. The Pope immediately interrupted him: "I deserve no praise," he said. "I have always had great difficulty sleeping and between work sessions at night I rest by listening to music. . . ."

As a matter of fact, the Pope, who for years had accustomed himself to sleeping four to six hours a night, had recently lost even this brief period of repose. He was now sleeping only one hour a night!

Furtwängler remarked that he, too, for a certain period of his life, had been the victim of a similar insomnia. It was at just this period that he had taken refuge in Niehans's clinic: "A friend," he told the Pope, "who is also a surgeon, has assured me that these crises symptomize a general disequilibrium. Now this friend is the inventor of cellular therapy, one of whose procedures is, in fact, to restore the organism to its equilibrium by treating with new cells those organs which have become unable to play their part. . . ."

The Pope knew Niehans's name. Sister Pasqualina

had spoken to him of the doctor several times and the name had remained in his mind. The Pope always paid close attention to Pasqualina's remarks, for he felt great affection for her. There is a story that when she had broken her leg some years before and entered the Giusisana Clinic, at Parioli, Pius XII telephoned every day in person to inquire after her health. One day, the clinic's Mother Superior—an American nun—picked up the telephone herself. A voice asked for Pasqualina.

"Who's calling?"

"The Pope!"

Exasperated, the Sister hung up, not without having expressed her annoyance with considerable liberty of phraseology. She discovered her error a short time later, and then it was her turn to take to bed!

The Pope had known Pasqualina some forty years. As a cardinal, he visited the Benedictine Convent of Emseideln, in Bavaria, every year; here he rested and nursed his lungs. Sister Pasqualina Lhenrat, a Franciscan, was his attendant. Today, at seventy-four, she has lost nothing of her authority and force of character. She is an image of the old, remote Prussia for which she has kept all her sympathy. Professor Niehans is a man who stirs memories of her youth. Most likely she is not unaware that the blood of the Hohenzollerns flows in his veins, for his

resemblance to Kaiser Wilhelm II after his abdication is striking. Doubtless she supports—if she does not provoke—the first audience granted to the Protestant scientist.

It is not known whether Dr. Galeazzi-Lizzi and the other papal medical practitioners were consulted. On October 14, 1953, Dr. Niehans and his wife arrived at the Vatican for a private audience.

Once again it must be pointed out that no official record of this audience exists. And Niehans, though reproached for seeking publicity, has never given an account of his interviews—or, with good reason, of his medical consultations.

Innumerable “semi-official” stories are circulated. Great doctors have not hesitated to call a press conference following consultations in which their suggestions were rejected. In the very heart of the Vatican, positions change several times, particularly that of Dr. Galeazzi-Lizzi. In this confusion, extreme prudence must accompany any attempt to discover the truth.

The first audience on October fourteenth is followed by a second two days later at which, Dr. Galeazzi-Lizzi, the Pope’s chief doctor and the possessor of his confidence, is in attendance. During this second meeting, Niehans examines his illustrious patient and reaches the conclusion that sheer fatigue is at the origin of the Pontiff’s loss of sleep. The chief

doctor is opposed to any ingestion of drugs and Niehans is delighted with this categorical attitude. The cardiac state is not perfect, but upon superficial examination, no precise complaint appears. Merely, Niehans repeats, an extreme fatigue.

The Pope glances at his own doctor. For ten years he has accustomed himself to insomnia. Then he turns toward Niehans: "Can your treatment restore my sleep?"

"On one condition! Give me eight days of complete rest! It is impossible to perform injections on an organism in such a state."

"Then it is impossible!"

The interview has taken place in Italian. It continues for several minutes more, Niehans attempting to obtain this week of "decontraction," supported by Galeazzi-Lizzi—and the Pope declaring that it is impossible for him to interrupt the routine of his work. Before this determination—which the threat of distressing developments did not manage to shake—Niehans is obliged to yield. At least the Pope promises to take a week of rest when his tasks have become less pressing. Niehans still insists on the necessity of maintaining the human mechanism at less than the limit of its capacities. In his opinion, his Holiness had long been in this zone of "over pressure." Pius XII smiled; the interview was over.

For several days the Pope's image haunts the

doctor. Back in Vevey, he often interrupts his work and remains staring into space for a moment, murmuring, "But how, how can he go on?"

Perhaps it is to his Protestant theological background that Niehans owes a familiarity greater than that of most doctors with the problems of interaction between the psyche and physical effort. During the war, he examined deportees from concentration camps who, physiologically, should have succumbed long since. He knows that there exist in the human body resources of energy, of pure strength, of which orthodox physiology is quite unaware. There is a superman in each of us. What are the unknown barriers that keep him incognito?

And why is it that certain men, in certain circumstances, can fall back upon this treasure? Is the explanation of a strictly spiritual order, and must medicine lay down its arms before such problems? For a moment, Niehans wonders if he was right in imposing a preliminary week of rest upon the Pope; taking into account this particular physiology, should he have treated the patient without preparation?

This would involve an enormous risk.

Niehans has never ceased insisting upon the necessity of carefully preparing patients for the injection of new cells. He has always proceeded by a scrupulous tracking down of the sources of infection (the in-

jection of new cells can be extremely dangerous in an organism under attack by microbes: the cells exacerbate the bacillary action). The tiniest secretaries within a tooth is a contra-indication. And there is also the problem of the lactic acid which, during states of fatigue, is secreted within the muscles; the cellular solution must not come in contact with this. Could he abruptly ignore all these dangers which he had spent his life pointing out to others? On the other hand, he was convinced that the Pope would never find time for this week of rest. He would force his organism to the very limits of physiological resistance. One day or another, his mistreated body would ask for mercy. Under these conditions, should he, Niehans, have taken the risk upon himself?

Now, in any case, it is too late. Niehans, disturbed, wrote to the Vatican shortly before Christmas. Was Pius XII ready for a cure? The chief doctor replied: he had on several occasions put the question to the Pope, who had now spent several consecutive nights without sleeping, but had obtained only vague promises. The papal practitioner did not conceal his anxiety. The Pope's cardiac rhythm was weakening, there were certain disturbances, and a progressive emaciation. The patient's activity, however, had augmented still further as a consequence of the



virtual absence of sleep. Nevertheless, Dr. Galeazzi-Lizzi still hesitated to administer sedatives.

During Christmas holidays, 1953, the shores of Lake Lemano were covered with snow. Niehans took long walks (he has no car) without an overcoat. His thoughts often carried him back to the bedroom in the Vatican. Still the same question: How can he go on? At night, in his villa, among his Renaissance paintings, listening to the latest recording of a Beethoven symphony on the high-fidelity set that is another of his prized possessions, Niehans was still thinking of the Pope.

In January, 1954, Niehans made a trip to Germany. In February he returned to Vevey, as if warned by some foreboding: on February twelfth came an alarmed telephone call from the Vatican. An hour later Niehans was at the airport and that evening reached Castel Gandolfo where the Pope was struggling against death.

The chief physician rapidly brought Niehans up to date: the patient had suddenly begun vomiting and had not ceased since. Already a great deal of blood had been brought up. The stomach would not tolerate so much as a spoonful of ice water. Intravenous feeding had been begun. Niehans approached the patient. Stretched out on his bed of black wood, beneath a tremendous crucifix, in the half-darkness of

the room, the Pope lay motionless. His eyes were fixed upon the window. Niehans saw that he had grown much thinner. The transparent skin of his face was stretched upon a frame of bone. At regular intervals the patient's thoracic cavity was stirred by an attack of hiccoughs. These contractions, which had continued since the day before, seemed extremely painful. At each convulsion, the patient's eyelids lowered. He smiled faintly when he recognized Niehans, but soon plunged back into his meditation.

Dr. Galeazzi-Lizzi feared the worst. He pronounced the word cancer. At the very least, given the vomiting of blood, a gastro-duodenal ulcer. Niehans replied that, prior to a further and deeper examination, there was no reason to foresee the worst. And he gave a minimum diagnosis: hemorrhagic gastritis. Then, with the chief physician's consent, and with the assistance of a nurse, he raised the Pope in his bed and turned him on his right side. Since the first blood vomitings, the patient had been maintained in a rigorously horizontal position. Niehans begins to massage the Pope's stomach and manages to have him swallow two spoonfuls of ice water. The hiccough contractions occur at longer intervals; within ten minutes they disappear. This is an enormous achievement.

The orthodox treatment for hemorrhagic gastritis

consists of a stomach lavage, but the patient's extreme weakness forbids any intervention of this kind.

The night passes calmly enough; the hiccoughs seem definitively conquered.

The morning of the next day, Niehans and Galeazzi-Lizzi were walking in the garden. Newspapers were brought to them: news of the Pope's illness had spread through all Christendom. His recovery was universally prayed for, but no one knew that at his bedside a Protestant doctor was considering the most serious decision of his life.

It is virtually admitted today in European medical circles, that Niehans, from the second day of the Pope's illness, administered cellular injection. There is still discussion as to whether he injected new cells taken from a pregnant ewe, which he himself had gone to select the night before from the farms of the papal residence, or his famous lyophilized (*i.e.*, vacuum-frozen) cells, with which he had just declared himself completely satisfied. An Italian reporter, after an extremely careful investigation at Castel Gandolfo, has been able to ascertain that during the night there was a certain disturbance on the farms of the pontifical estate, but nothing permits us to infer from this that a ewe had been sacrificed for medical purposes. The daily provisioning of Vatican City, where more than fifteen hundred people live, is furnished by the farms of this estate. Five

trucks regularly assure its connection with Rome. Doubtless the German paper was unaware of this fact when it printed the following headline: "Heifers and ewes are raised in secret on Niehans's orders on the estate of Castel Gandolfo."

One of the French adepts of cellular therapy has given, in the Parisian newspaper *Libération*, an account of the morning's events. According to him, the treatment applied to the Pope consisted of *preserved* embryo cells from the liver, stomach, pituitary gland, placenta and endocrine glands. Others maintain that Niehans sacrificed a ewe at dawn with the assistance of the chief physician, and this time, given the gravity of the situation, did not hesitate to administer fresh cells.

The injection safely undergone, Niehans works out a maintenance treatment.

He remains at Castel Gandolfo for eight weeks. The news of the Sovereign Pontiff's cure provokes the most varied comments the world over. Niehans's presence cannot remain a secret. Every newspaper proclaims it. The Vatican does not deny the fact—which gives rise to the most sensational medical hypothesis.

As foreseen, an evident improvement in the patient's condition is manifest five weeks after the injection. He now takes nourishment normally and is recovering strength. He gets out of bed by the end

of February. His first visit, it is said, is to the next room, where the little goldfinch which he found fallen from its nest in the Vatican gardens is kept. Sister Pasqualina named it Gretel and it perches on the Pope's shoulder when he shaves. Day after day the patient's state improves, and he now takes walks in the park accompanied by Sister Pasqualina, Galeazzi-Lizzi and Niehans. He works in bed, and Niehans is astonished to note how rapidly he has effaced the rupture which has occurred in his life; he remarks with what facility Pius XII can synthesize—from accumulated newspapers, the notes of his assistants, the bulletins of his press services, and books from all parts of the globe—the events he has not been able to follow during his illness. A photograph in a popular magazine provides him with as much information as a diplomat's technical study.

Around April fifteenth, the patient has regained his weight as of the period before the attacks, and is considered officially cured. Niehans, who has spent almost two months at Castel Gandolfo, returns to Vevey. Shortly afterwards, the Pope returns to the Vatican.

In July, Niehans is again in Rome. At the Vatican, in the famous third-floor bedroom, he finds his patient in what seems to be perfect health. The Romans survey the window of this room and calculate quite precisely the number of hours the Holy Father

sleeps! Niehans, recognized in the Via Veneto, is the object of enthusiastic acclamations. Despite his protests—he declares that the Pope's cure is an ordinary case—journalists crowd the door of his apartment in the Hotel Majestic.

After a day or two of absolute rest, which the Pope grants himself with great reluctance, Niehans performs a second series of injections. There is no more information concerning this booster-series than about the first. Are new cells or preserved cells being used? Have they had, like the others, a characteristic revitalizing effect? Probably, since fifteen days later the Vatican announces that the Holy Father is preparing to leave, as every year, for his summer residence. The Romans who catch a glimpse of him on the Via Appia through the windows of his old black Cadillac, between his telephone and his tape recorder, find him looking rested. His old chauffeur, the faithful Marius Stoppa, declares "His Holiness is feeling fine." Though the Roman reporters besiege Castel Gandolfo, assail Cardinal Canali, director of the villa, and even Stephanori, the head valet, they have nothing to report but the Pope's good health—without shedding any light on the treatments he has undergone.

Niehans, who has reached Castel Gandolfo in Sister Pasqualina's old white-curtained Ford, is satisfied with his patient. He returns to Switzerland wear-

ing dark glasses in order to escape the reporters. He is famous now. His photograph has appeared in innumerable papers, and for many readers he is "*the doctor whose cell injections have rescued the Pope from death.*"

The vacation passes without incident. At the end of August, Niehans is invited to explain his theories to the great Congress of Endocrinology in Karlsruhe. Doctors from all over the world vie for seats. As usual, Niehans is extremely reserved. His remarks are explicit, but he intentionally clothes his thought in a scientific vocabulary. An entire day is devoted to his work. At the end of the Congress, the audience pays him enthusiastic homage. Many vocations are inspired in Karlsruhe that year, and many great doctors return to their hospitals aware of the wealth of new perspectives.

In November, 1954, Niehans returns to Rome with his wife. A tireless worker, he has decided to take a week's vacation. He stops incognito at the Grand Hotel. The Pope is still at Castel Gandolfo and is preparing to return to the Vatican the next day. That evening, while lifting a heavy strongbox in which he keeps his secret documents, the Pope suddenly experiences a terrible pain in his chest.

Almost at once he is seized with a fit of coughing while the pain spreads to the epigastric region. He is choking. Sister Pasqualina, who has learned of

Niehans's presence in Rome, summons him at once. He arrives a few minutes after Dr. Galeazzi-Lizzi. A first examination produces alarming results: both doctors agree to call into consultation Dr. Paolucci, the most famous surgeon in Italy, and Dr. Gasbarrini, a celebrated diagnostician. They arrive one after the other during the morning and are in agreement: the Pope's effort has provoked a diaphragmatic hernia. This is an accident having no connection with his general state of health. Upon his arrival, Paolucci asks for an X ray and a blood test, and declares himself in favor of an immediate incision. Niehans flatly opposes this decision. The patient's general state of health, he declares, does not permit an operation of this kind: he would not survive it. Sister Pasqualina, who has listened to the deliberations without taking part in them, is of Niehans's opinion. Early in the afternoon the atmosphere is extremely heavy. The three German nuns who assist Sister Pasqualina (all four have taken their vows in the same convent, that of Zug, in Switzerland) begin praying. Dr. Gasbarrini, whose opinion would be the decisive one, refuses to decide for or against the operation. Finally, Paolucci indignantly asks Niehans to formulate in detail the treatment he advocates.

Niehans proposes merely anesthetizing the phrenic nerves with novocain in order to relax the dia-



phragm. Once this is achieved, the patient would swallow a purée of potatoes whose weight would free the portion of the stomach momentarily strangulated.

Niehans's proposition appears absurd to Paolucci and displeases Gasbarrini: it sounds too simple. To treat a hernia with mashed potatoes is a quack's remedy. Moreover, they threaten, it will obtain no result.

"An operation," Niehans replies, "will have a result which I know only too well."

Sister Pasqualina apparently urges him to act. The patient is in the worst possible condition; now choking constantly, groaning with violent pain.

Niehans, once the injection is administered, has some difficulty getting his patient to swallow the purée. But the effect is swift. The hernia is reduced by the weight of the aliment. That evening an X ray confirms this excellent result.

Doctor Paolucci has no intention of concealing his dissatisfaction. He has an extremely animated interview with the Pope's nephew, Prince Carlo Pacelli and with Monseigneur Montini and Monseigneur Dell'Acqua. There exist several versions of the facts. When the magazine *Oggi* publishes a complete account of this cure, affirming that cell injections have once again been performed and that the Pope has exclusively followed Niehans's prescriptions, it in-

curs two denials: the first from Doctor Paolucci, the second from *L'Osservatore Romano*. Is the chief physician, Galeazzi-Lizzi, responsible for the second? Is it true that without informing Niehans, the other consultants had administered two blood transfusions?

For the moment, one is forced to accept all rumors—and they are many. From royal jelly to chicken embryos, every revitalizing product is invoked to account for the cure. The chief physician seems to have modified his position. He is much less pro-Niehans than he was. Nevertheless he has not hesitated to write, in a popular weekly: "When an organ is diseased—or weakened by old age—its cells seem tired of reproducing: the cadence varies, the form changes. How can we combat this degeneration if not by providing the exhausted organ with new cells? That is what is done today." Yet when insistent rumors circulate that the Pope has abandoned all idea of continuing cell treatment, Galeazzi-Lizzi does nothing to have them stopped.

Sixty-eight years old, a former automobile racer under the surprising name of Mahomet, Galeazzi-Lizzi is also a specialist in prolonging life. He has been summoned on consultation to Bonn by the doctors of Chancellor Adenauer. His experience with old men is vast: for many years he labored in the archives of the Salerno Medical Academy, famous

during the Renaissance for its studies of rejuvenation. In addition to this lore, he possesses a profound knowledge of the latest studies, particularly of cellular therapy. Like Niehans, who was offered Fleming's chair, succeeding the inventor of penicillin, Galeazzi-Lizzi is a member of the Pontifical Academy. Twenty doctors work under his orders. But his influence reaches its apogee on the Medical Commission on Miracles, of which he is president. No saint can be canonized, none of the blessed can be beatified, no miracle ratified, without his approval. All the files of the cures at Lourdes are submitted to his evaluation. The importance of his functions at the Vatican has made him many enemies. He is particularly criticized for owing his position to the Pope's friendship for his brother, the architect, Galeazzi. The Villa Pacelli, in Rome, was next door to that of the Galeazzi. The older members of both families spent their entire youth together. It was only in 1940 that the youngest Galeazzi, a specialist in ophthalmology, became chief papal physician. Under the pressure of these new functions, he abandoned ophthalmology. His various declarations about the Pope's cure have not helped ascertain Niehans's role.

At the end of November, 1954, the Pope's recovery established, Niehans returns to Switzerland. He will come to Rome once again, in 1955, to per-

form, it is believed, a third series of embryo-cell injections. Subsequently, he will make other trips to Rome, but it is not known if he will apply further booster-series of injections.

The patient, in any case, has recovered all his energy—and has resumed his activities. At eighty-three, he gets up regularly at five in the morning after sleeping five or six hours. He says Mass in his private chapel. Around seven o'clock, he takes his breakfast: a roll made by his baker, Pepino, and a little tea. When he is obliged to stay in his room and cannot say Mass, it is Sister Pasqualina who goes to St. Peter's (which is how the officials learn that the Holy Father is ill).

No official text, no declaration, has confirmed that the Pope ever received injections of cells, fresh or preserved, but if one adds up the time Niehans spent with his illustrious patient, the total reaches almost three months! Why was Niehans so frequently called in if there had been an official decision to rule out his proposals?

## *The Case for the Defense—Continued*

DR. NIEHANS's clinic at Burieh-Vevey, near Montreux, is a great square building with a pointed roof, set in well-cared-for grounds on the shore of Lake Lemman; the peaceful landscape is characteristically Swiss.

The structure bears in small black letters the name of Dr. Ody, who performed operations behind these walls until his death in 1957. At that date, Dr. Niehans, who occupied only one of the two floors and the adjacent installations, bought the entire building and the grounds from Dr. Ody's heirs.

Until this period, the administration of cell injections to sick or aged patients, as well as the research conducted by Niehans and his assistants, had been accomplished without difficulty. Speculation about activities at Vevey started among a few local residents, who had been astonished to see automobiles flashing through the clinic's grounds at dawn. It was

known that they came from the slaughterhouse in Clarens, and there had even been a rumor that Ody, a specialist in brain operations, and Niehans, a connoisseur of glands, were devoting themselves, behind the heavy green shutters of their clinic, to mysterious attempts to resuscitate the dead by means of animal elements. These ridiculous rumors, circulated toward the end of the war, when the world was discovering the nightmares of Nazi extermination, have left a few traces at Vevey and Montreux: "I wouldn't walk around that clinic at night for anything in the world," says one old newspaper vendor. "You hear noises there that aren't human!"

In reality, silence reigns around the clinic both day and night. A sign along the road requests drivers not to sound their horns. Niehans has often insisted on the necessity of calm rest for his patients. His own work also requires silence.

It is here, on the second floor, that the first cell injections were administered to patients. Here, too, Dr. Niehans injected himself with frozen cells, after which his distressed assistants recorded the allergic reactions that might well have caused his death. Doctors the world over who have created fresh-cell clinics have come to receive their first instruction here. (Today, in Germany, Dr. Karl V. Sprado and Dr. Lettre have installed research laboratories more elaborately equipped than those at Burieh; but if

certain students have passed beyond the master with regard to pure research, Niehans's authority has never been seriously questioned.)

Universally recognized and respected by the celulo-therapists, the mecca of the new cell is not readily accessible. The first problem is to get through the fence into the grounds. The gate is electrically controlled from the porter's lodge. Even Niehans, who possesses no key, must wait a few seconds. Taxi drivers from Montreux, bringing famous clients, are recognized at night by a secret headlight signal. During the day an informed observer probably identifies their cars. After the gate opens, the real formalities begin at the door of the clinic itself.

The client presents his appointment notice. The nurse on duty, a pitiless sentinel, takes it and disappears, having closed the door behind her. She returns only after several moments, having checked the appointment with regard to both date and hour. Only then do the doors open for the new inmate, who vanishes into a dark hall. A butler takes his suitcases, which disappear into the building by another route.

None of the famous old men or illustrious patients credited with a cell cure in Niehans's clinic has ever given an account of his stay. No one knows anything about the "cell experience" from inside. But we know in detail what happens externally.

The candidate who makes contact (by letter or

telephone) with Dr. Niehans's staff receives the following reply: "We regret to inform you that our services are unavailable for at least six months. We can no longer add your name to our waiting list. We advise you to telephone again in three months or to apply to another fresh-cell clinic."

Most often, the candidate requests the intercession of his own doctor who, either by influence or the pressure of a serious medical case, obtains a favorable reply. There can be no question of immediate reception, but a place may be obtained within a three-week term of waiting, or perhaps a month.

Upon his entrance into the clinic, the "curist"—the name by which the inmates of Burieh are designated—receives a case number. His incognito, should he have one, is respected absolutely. New cells represent such a source of profit for the canton that even the police co-operate: no client waiting in the area to enter the clinic need fill out a hotel registration card. No identity is ever checked. There is one story that a rich American, supposedly on a business trip, spent two weeks incognito in Niehans's clinic without ever knowing that his wife (officially on an Oriental cruise) was in the next room. When they met again, in California, they congratulated each other on their mutually splendid appearance, speaking of their distant voyages, unaware that during



their entire separation they had been sleeping on opposite sides of the same wall!

A nation of bankers' secrets, Switzerland has become the nation of rejuvenation's as well. But the opening of an account in either case presupposes a number of formalities. The curist must fill out a file—with his doctor's assistance—a kind of physiological balance sheet, required by the clinic.

First on this list appears a note from the patient's doctor explaining why cell treatment seems necessary to him. (Hence, no curist can be admitted to the clinic on his own initiative without being "sponsored" by a doctor.) The clinic next requires a copy of all the examinations made during the years preceding the cure (electrocardiograms, X rays, various analyses, etc.). If the curist's condition requires it, new examinations are performed upon admittance to the clinic. (And finally, the stumbling block of the cure that is to follow, the Abderhalden test must figure in the file.)

This is a biological examination of the patient based on the analysis of the defense-ferments found in the urine. Abderhalden, a Swiss doctor who died at the beginning of the century, has shown (although his studies are often strongly criticized even today) that when any ailment occurs in an organ, certain proteins appear in the blood. These proteins pro-

voke the formation of specific defense-ferments which are found in the patient's urine. A careful analysis of these ferments, therefore, permits the discovery of the diseased organs—those which will be improved by an injection of new cells.

The laboratories qualified to administer an Abderhalden test properly are rare: two or three in Switzerland, two or three in Germany, one in Scandinavia. According to Niehans, this research provides valuable indications which he personally regards as indispensable, though he admits that certain doctors may do without them. Concretely, the test involves a long strip of paper in which the name of each organ of the human body is printed opposite a series of little white squares. Each organ from which defense-ferments are recovered, is indicated by a point. The position of the point on the horizontal level represents the virulence of the ferment identified.

In most cases, the doctor of the clinic entrusted with studying the new inmate's file regards it as insufficient and, after a first examination of the curist decides to proceed with complementary analyses (blood tests, X rays, etc.) throughout the day. He also frequently requires a new Abderhalden test which increases the preliminary stay in the clinic by three or four days.

The curist, during this entire preparatory period,

is installed in a room which he will not leave during his entire stay. The walls are painted a light color, and there is a telephone and a radio. Each group of five rooms is in the care of a doctor. In general, Dr. Niehans himself, without being announced, appears on the first day at around eight in the morning. (When he is at Vevey, he visits each new inmate in person.) He wears a white surgical smock, no hat, and expresses himself with great courtesy in German, English, French or Italian. "I am Dr. Niehans," he says. "I hope you have an agreeable stay in my clinic!"

One South American curist has declared that the appearance of Dr. Niehans, with his severe face and his piercing gaze, provokes a strong reaction: "I don't know how to explain the impression, but a remarkable power emanates from this fantastic man!"

Dr. Niehans is ordinarily accompanied by the doctor who has received the curist and by a nurse who carries the complete file in a cardboard case. After exchanging a few words with the patient, Dr. Niehans consults the file, turns toward the other doctor, asks several questions, and himself establishes the injections and their dosage. Then he shakes hands with the patient and usually says: "You will stay in bed for three days. I should like to see you again in three weeks. Good luck. *Au revoir!*"

The injection, in most cases, is administered toward nine in the morning, an hour after the doctor's visit. An extremely light breakfast (tea, dry toast) is served to the curist who never fails to ask, "Will it be soon?"

"In just a little while."

Half an hour before the embryo of an animal (pregnant cow or ewe) from the slaughterhouse of Clarens, less than ten miles away, has been brought to the clinic. The veterinarian who has performed all the preliminary tests has accompanied the embryo to the laboratory in the clinic's cellar. Here the injectable elements have been removed and pulverized. Now they are being mixed with the serum in the syringes.

The door of the patient's room has just opened. Again it is the same doctor who received the patient. He is followed by a nurse carrying a tray. In cases of a general "revitalization" cure—without ailment of a specific organ—the tray holds five syringes of different colors. Each syringe contains approximately 10 cm<sup>3</sup>—7 cm<sup>3</sup> of serum, 3 cm<sup>3</sup> of cells. In certain cases, there are actually as many as seven or even eight simultaneous and different injections. When treating a specific organ, there is only one injection—or two—the second serving as a booster.

All the injections are given at the same time: a local anesthetic of ethyl chloride is given in the but-

tock. The trocars penetrate simultaneously, then the liquid is readily injected.

The doctor disappears. Another nurse is waiting for him in front of the next door with another tray of syringes.

The "injected" curist will remain under the nurse's surveillance for half an hour. Soon his anxiety disappears; the nurse is there to reassure him: "There is practically no reaction!"

Very rarely, the curist suffers a slight rise in temperature. The pain in the buttocks disappears quickly. The following day or the day after that, a slight urticaria may appear. In this case, the patient receives Phenergan. All these manifestations are of no importance. The only real danger is the possibility of an abcess forming at the injection point, but a constant local surveillance is maintained.

Having become a member of the large family of fresh-cell injectees, the curist, who is advised to remain in bed, receives, an hour after his injection, a memorandum which he is asked to read carefully. This consists of "*advice to patients who have received fresh cells*":

It is important to remain in bed at least three days, four if possible, not because of an eventual reaction, but in order to leave in peace, in the buttock muscle, the precious cells which are about

to undergo an extraordinary dissociation process.

You may get out of bed only to go to the toilet. Meals must be taken in the room.

Dizziness is a frequent occurrence during the first risings. Therefore, patients must be careful to avoid falls in going to the toilet.

After these first four days, you may resume your normal activities, but you must avoid overexertion.

During these first four days, you will be fed quite frugally: vegetable soup, dairy products, vegetables, fruits. No meat before the third day.

For the following fifteen days, avoid spices and stewed foods. Venison and other game, pork and shellfish are forbidden during the same period. Ordinary fish is permitted.

Alcohol in any form, including wine, is forbidden for several weeks.

Tobacco is absolutely proscribed for at least a month.

A state of fatigue, of unaccustomed languor, is frequently observed during a period of two to three, even four, weeks after the injections. There is no cause for alarm in this development.

Since the embryo cells are much more sensitive to toxins and poisons than adult cells, you may not receive any medication that might annul the action of the new cells without mentioning it to us

or without asking the opinion of your doctor (thus belladonna, opium derivatives, strychnine and arsenic are forbidden).

On the other hand, digitalis drugs, phosphoric acid, are permitted.

It is recommended that you take as many vitamins as possible, whether pharmaceutical or natural (fruit, green vegetables, raw milk, butter, cream, cod liver oil, etc.).

As a general rule, new cells, once injected, do not produce serious reactions. They are, in any case, virtually harmless. It is normal to experience some pain in the buttocks for two or three days.

During the days following injection, the patient may experience—although this is exceptional—a sudden rise of temperature or a slight urticaria. These phenomena, which are actually of an anaphylactic nature, generally respond favorably to some antihistamine drugs (Phenergan, Antistine, Di-Paralene, Allerga, Domistan, etc.)

In any case, it goes without saying that at the slightest danger signal, even a belated one, the patient must inform his own doctor, to whom we will give all the necessary directions.

When he has left the clinic, the patient is requested to provide us information as to his health every month for several months and, following that, every year.

The patient should understand that cellular therapy is not a panacea. It does not cure everything. It does not always cure. On the other hand, certain patients resist cellular therapy more than others, and treatment must often be repeated several weeks or several months later.

Like any other form of therapy, cellular therapy requires the attentive surveillance of the patient by his own doctor.

Finally, cellular therapy is a school of patience. The lasting results are often long in appearing: sometimes two months, sometimes three, sometimes much more.

But with regard to this therapy, as to others, the patient must remember that he is also the artisan of his own cure, depending on his will to recover and his faith in the treatment.

Heaven helps those who help themselves. . . ."

Three hours after the injection, a light meal is served to the curist. Newspapers are brought to him if he wishes to see them, but he is not allowed to smoke under any circumstances. He can receive and make telephone calls, but no visits are permitted. Visiting is absolutely forbidden in Dr. Niehans's clinic. A light soporific is probably mixed with his supper, for in general the hospital lights are turned out at eight o'clock.



The two following days pass without incident. Morning and evening the young doctor comes to examine the curist carefully. The nurse is authorized to vary the menus at his request. On the morning of the fourth day, the patient, if he shows no organic or local difficulties, is considered as having undergone the injections satisfactorily. Certain cautious curists prefer remaining in the clinic another day or two. In general (this is not a rule) Professor Niehans himself comes to observe the patient the third or fourth day. He makes a rapid examination of the injection points and then inquires into the patient's reactions. For the most part, these reactions are nonexistent. The clinic doctors do not hesitate to declare that they prefer this absence of reaction to a certain spectacular improvement that appears toward the fiftieth hour in some injected patients and which seems to be a result of the potent hormonal action of the foetal cells. This spectacular improvement, though it raises the patient's confidence, is not desirable, for it is temporary and automatically involves a disappointment. Dr. Niehans always warns his patients against the negative period that extends from the second to the fourth week following the injection. This is what is known as the "stress." Instead of improving, the curist feels worse. The injected cells die. The organism, which has received foreign proteins in great quantity, is seeking

its new equilibrium. It must reorganize itself to lodge these tumultuous new inhabitants. . . . It is only at the end of this period of depression that the curist will reap the fruits of his treatment.

Thus informed of the different phases of his convalescence, the curist is prepared to leave the clinic as discreetly as he arrived. Dr. Niehans has wished him good luck with a smile; the case doctor has informed him that his file will henceforth be followed month by month according to specific indications received from his own doctor. Furthermore, the clinic asks each curist to remain personally in touch by mail with the clinic's medical secretary: quite frequently booster injections are given. In certain cases, an annual injection consolidates the new biological structure built up by the massive contribution of new cells. In any case, the clinic "follows" each file with close attention. "It's for our statistics," the head nurse specifies.

It is she who ordinarily takes the patients on a tour of the clinic if they are interested. The laboratory where the cells are treated is visible behind plate-glass windows. Germicidal lamps are set up everywhere. Measures taken to get rid of microbes are extraordinary. Dr. Niehans has never ceased to insist on this point: the slightest bacillary intrusion annuls the entire pulverization process. Thus, the placing of the cells in the syringe and the passage of

the syringe from the pulverization room to the nurses' room is made through special tunnels, for there must be no contact between the sterilized area where the doctors work and the polluted region outside.

During this tour, the curist meets no other inmate. If there is risk of encountering one by accident, he is shunted off into a side hall. Even in the secretary's office he is addressed by a faceless voice from behind ground glass.

Now he must deal with his last formality: paying the bill. There has been a great deal of talk about the enormous sums curists are charged at Burieh-Vevey. Here is a bill presented early in 1958:

#### MINIMUM BILL BY ORGANS TREATED

*(Private)*

	SWISS FRS.*
Choice and examinaion of the animal by the veterinary .....	10
Blood test by the veterinary and shipping of the animal to Berne .....	20
Serological examination of the blood of the se- lected animal .....	25
Purchase of the animal .....	120
Transportation of the animal to Burieh .....	20
Care of the animal .....	30
Labor costs at the slaughterhouse of Clarens .....	25

Transportation to and from the slaughterhouse . .	5
Sterilization for operation in laboratory . . . . .	20
Labor costs for removing the organ . . . . .	20
Labor costs for dissolving the organ into cells . . . .	20
Laboratory costs (rent, light, heat, hot water, instruments, linen, cleaning) . . . . .	65
	<hr/>
TOTAL	380
	<hr/>

*Fees:*

Operation: removal of an organ from the animal	50
Dissolution of the organ into cells . . . . .	50
Intra-muscular installation of cells, and checking	20
	<hr/>
	120
	<hr/>
Total of fees and expenses per organ . . . . .	500

\* 1 Swiss Franc = \$.23 $\frac{1}{3}$

The curist who has undergone a revitalization cure on the basis of injections of cells for five organs, pays for this treatment alone, 2500 Swiss francs. The total, including all clinic expenses, amounts in this case to about 4,000 Swiss francs or \$1033. It is evident that this second youth is not within reach of every purse. But Dr. Niehans, when the high price of the cures performed under his roof is mentioned, replies, "In Germany, there are centers where cellular-therapy injections are administered under perfect conditions at much lower rates. At certain hospi-

tals injections are even given free. I strongly advise all patients who hesitate before the expenses here to go to these centers." And he sometimes adds, "To protest about the cost is to deprecate the worth of the benefit the cells provide. . . ."

Dr. Niehans is sure of his triumphs. Everyone who has consulted him has become aware of this assurance. In Niehans's remarks, in his way of dealing with problems, there is little place for failure or for doubt.

Though one may not follow him along this path, no objective observer can deny certain cases of improvement and a few spectacular cures. The statistics of the clinic in Burieh-Vevey have never been made public in their totality, but the percentages, it seems, are impressive. There is also a rumor that Dr. Niehans possesses a personal scrapbook of letters from famous patients expressing their gratitude and attributing to him in explicit terms the credit for having cured their diseases—or prolonged their lives.

*Dr. Niehans's*  
*Personal File*

IN October, 1958, the third Congress of Cellular Therapy was convened in Paris, presided over by Professor Haubold of Munich. It had been thought that Dr. Niehans would speak the second day, but then his patient, Pius XII, suffered the onset of the attack which was to end his life, and Dr. Niehans, informed of this after an evening at the opera, abruptly left for the Vatican; the communications of Professor Bernhardt (from Duisberg, Germany), of Dr. K. H. Neumann (of Cologne), of Professor Schmid (of Heidelberg), and of Doctors Heny and Picouret (of Paris) demonstrated that in many domains the study of the action of new cells had increased widely—particularly in cardiology and in the field of vascular diseases.

The congress adjourned, remarking that under no condition could the power of new cells be regarded as definitively established. But, in the light

of recent studies, the new method's list of effects and activities grows increasingly precise and complete, though it is still far from a definitive theory.

Every man, even if he has devoted his activities to the defeat of death itself, reaches a stage in his life where he feels an imperious need to synthesize his experience. Dr. Niehans is no exception to this rule, and in his study, *Cellular Therapy* (which was published in French by Editions Payot, 1957), he drew up a table of diseases and ailments favorably affected by new cells. In making this synthesis he has examined more than fifty thousand observations and passed in review all the files preserved in the archives of his clinic.

Here is this list as Niehans offers it. Certain résumés of treatment have been added, taken from the files of German and French cellulo-therapists:

*Developmental Diseases*

Premature childbirth with insufficient weight of infant	Corresponding adv. placenta cells of the same sex. ("Adv. placenta" means placenta in the last months or in the second half of the gestation period—i.e., advanced placenta. "Pre. placenta" means placenta in the first months or in the first half of the gestation period—i.e., premature placenta.)
Insufficient development of the infant	Corresponding adv. placenta cells.

Mongolism

Adeno-pituitary, thymus, thyroid cells.

Mentally retarded children

Cells from the frontal lobe with Broca and Wernicke regions, and thyroid cells.

Since the First World War there has been an increase in cases of Mongoloid imbecility and congenital malformations. Several factors can explain this increase: the age of the mothers, alimentary deficiencies, nervous and physical shocks—the exhaustion of the hereditary substance. New cells have contributed notable improvements.

In Paris an idiot child six years old receives injections of preserved cells; twelve weeks later his face is more expressive and regular.

A sickly six-year-old girl, although not Mongoloid, is intellectually at the zero point; new brain cells (frontal and temporal) are injected and she begins to speak, improves intellectually; sixteen months later she is going to school.

Development diseases in children  
(after encephalitis)

Cells from the inter-hemispheric brain "in toto."

Pituitary dwarfism

Acidophilic cells from the adeno-pituitary.

Pituitary obesity

Acidophilic cells from the adeno-pituitary, diet, exercise.

Pituitary gigantism

Basophilic cells from the adeno-pituitary, cells from the corresponding genital glands.



Pituitary emaciation	Basophilic cells from the adenopituitary, cells from the corresponding genital glands, suprarenal cells.
Primary amenorrhea	Basophilic cells from the adenopituitary, pre. placenta and follicular cells.
Infantile uterus	Basophilic cells of the adenopituitary, pre. placenta and foetal cells.
Diabetes insipidus	Cells of the posterior lobe of the pituitary, and cells of the <i>tuber cinereum</i> .

Extensive studies of the pancreas have been made. The injection of cells taken from the pancreas of a young, already active and secreting animal is no longer administered because of the danger of abscesses at the injection points. The foetal pancreas seems inactive in pancreatic sugar diabetes. On the other hand, results are encouraging with the injections of cells from the posterior lobe of the pituitary gland in diabetes of pituitary origin. In general, the subject rapidly diminishes—by half or two thirds—his daily doses of insulin.

In sugar diabetes the results are much less spectacular (save in the extremely rare cases where Niehans himself has been able to use human embryo cells).

“If the laws gave us the means to utilize all human foetuses aborted medically,” he says, “we would

have many more diabetics definitively free from insulin."

But it is apparent that therapy based on human cells—which Niehans declares to be sovereign in all cases of sugar diabetes—raises numerous problems.

Insufficient development of the testicle	Basophilic cells of the adeno pituitary, pre. placenta and testicle cells.
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### *Functional Diseases of Endocrine Glands*

Tetany with a lowered level of blood calcium	Parathyroid cells.
Osteo arthritis, pain from calcium overgrowth	Parathyroid cells.
Addison's disease	Cells from the suprarenal cortex.
Hypotension	Cells from the suprarenal medulla.
Partial sexual impotence in men	Testicle cells.
Azoöpermia	Adeno pituitary, pre. placenta and testicle cells; later hypothalamus cells and spermatogonia.
Oligospermia	Testicle cells, adv. placenta cells; later hypothalamus cells and spermatogonia.
Secondary amenorrhea	Cells of the total ovary and adv. placenta.
Habitual false pregnancy	Cells of the yellow body and adv. placenta.

Hyperemesis Gravidarum	Hypothalamus cells (gray matter at the base of the third ventricle), adv. placenta and foetal liver cells.
Migraine tendency	Hypothalamus and placenta cells (purgations).
Climatic sensibility	Hypothalamus and placenta cells.

### *Organ Diseases of a Degenerative Nature*

Myocardian lesions	Foetal cardiac muscle cells and adv. placenta cells.
Cardiac scleroses	Foetal cardiac muscle cells and adv. placenta cells.
Weakness after coronary infarct	Foetal cardiac muscle cells, adv. placenta and corresponding genital gland cells (not to be administered until three months after the infarct).
Vascular scleroses and disturbances of blood irrigation	Cells from the foetal vascular wall, adv. placenta, liver, spleen and corresponding genital gland.

At the 1955 therapeutic congress in Karlsruhe, Professor Oetzmann gave the following statistical table concerning the effects of cells on heart disease:

	<i>Cases</i>			
	<i>Treated</i>	<i>Aggravated</i>	<i>Stationary</i>	<i>Ameliorated</i>
Myocarditis	38	0	13	25
Coronary sclerosis	21	1	6	14
Coronary infarct	12	0	6	6
Arterial hypertension	19	0	12	7

It is apparently in the so-called "peripheral" ailments that the cells are more effective. Arteritides of the lower limbs are almost always improved. Amputations are avoided, gangrenal phenomena retrocede.

In angina pectoris cases, injections of liver, heart, testicle and suprarenal cells often provide appreciable results.

A woman fifty-one years old feels daily pains and must cease all activity; she takes a harmful amount of nitroglycerin and develops arrhythmia, edema. Kidney, heart and thyroid cells (preserved) are injected; the pains disappear and after three weeks, though the signs of coronary insufficiency still exist on the electrocardiogram, the arrhythmia has disappeared; the patient resumes normal activity.

Another patient of the same age appears to be on the brink of a definitive collapse with edema, choking fits and arrhythmia. In despair as to the cause, at her family's request (cellular therapy then being at its inception in France), the patient receives placenta, liver, spleen and heart cells; fifteen days later she has improved, but a buttock abscess makes an incision necessary; two years after this treatment she has recovered.

With regard to arterial hypertension or advanced cerebral sclerosis, results are much less encouraging.

Chronic nephritis with nephrosis	Foetal renal cells, adv. placenta, thyroid and corresponding genital-gland cells.
Lipoidal nephrosis	Foetal renal cells, adv. placenta, thyroid and corresponding genital-gland cells.

At the same 1955 congress in Karlsruhe, Professor Rietschel presented thirteen cases of nephrosis treated by new cells; after a year he had recorded five cures, four certain failures, four considerable improvements.

In favorable cases, there can be no question of the kidneys' regeneration, of which no example exists in medical history, but rather of a metabolic effect on the renal cells.

Hepatic dystrophies	Foetal hepatic cells and adv. placenta cells (later foetal cells from the mucous membrane of the stomach).
Compensated hepatic cirrhosis	Foetal hepatic cells and adv. placenta cells (later corresponding genital-gland cells).
Hepatic cirrhosis with the beginning of ascites	Foetal hepatic cells and adv. placenta, thyroid and corresponding genital-gland cells.

### *A French Doctor's Statistics*

	<i>Treated</i>	<i>Not Improved</i>	<i>Improved</i>
Cirrhosis	88	50	38
Various hepatitides	48	10	38

The conclusions are the following: for the treatment to take effect, the organ must still be capable of reactions. Advanced cirrhoses should not be treated, for the shock may provoke an aggravation of the ailment.

Cerebral sclerosis	Adv. placenta and corresponding genital-gland cells.
Cholesterolemia	Placenta cells (later corresponding genital-gland cells).
Bone-marrow lesions (including pernicious anemia)	Foetal red-marrow, adv. placenta, corresponding genital-gland and foetal hepatic cells.
Degenerative lesions of the gastric mucous membrane with achylia	Cells of the foetal gastric mucous membrane; spleen, adv. placenta and thyroid cells.
Agranulocytosis	Foetal red-marrow cells, adv. placenta, corresponding genital-gland cells.
Arthroses; chronic arthrites	Suprarenal cells, pre. placenta and thyroid cells.
Osteochondrosis	Suprarenal cells, adv. placenta and yellow body cells; spleen, joint, cartilage and corresponding genital-gland cells and synovia.

In the file of rheumatic diseases, observations seem less abundant than elsewhere. Here are two cases treated at the Paris center:

Madame F. N.———, fifty-two years old, suffering from rheumatoid arthritis for nine years and obliged

to keep to her bed for two, receives four injections of liver, suprarenal, pituitary and hypothalamus cells in 1953; five weeks later her general condition has improved, her appetite has returned, sleep is restored, strength regained and sensitivity to pain reduced; the patient can get up.

Monsieur E. D.——, fifty-four years old, suffering from rheumatoid arthritis for seven years, has undergone ablation of the tonsils, appendix and many teeth. He receives injections of liver, kidney, suprarenal, placenta, muscle and testicle cells at monthly intervals for three months. A definite improvement appears during the three following months, but the result is not convincing. There is a source of infection to which the relative failure of therapy can be imputed.

In cases of osteoarthritis, a good result is generally obtained following injections of suprarenal and thyroid cells.

Stepanchitz and Schreiner have treated thirteen cases of chronic rheumatoid arthritis and forty of osteoarthritis. They have obtained only a few or extremely limited results (three days) in the rheumatoid arthritis cases but much better results in those of osteoarthritis: 12 cases improved over a period of months, 14 over a period of weeks, 6 only slightly, and 8 not at all.

But even if substantial improvements are obtained

in only a portion of the cases, their results are nevertheless such that one can recommend thyroid implantation in cases of osteoarthritis, which are so difficult to treat effectively.

### *Manifestations Produced by Age and Fatigue*

Generalized arteriosclerosis	Adv. placenta cells and corresponding genital-gland cells.
Post-menopausal depression	Adv. placenta cells and corresponding genital-gland cells.
Melancholia as a consequence of an insufficiency of genital glands	Adv. placenta cells and corresponding genital-gland cells.
Neuro-vegetative disturbances	Hypothalamus and adv. placenta cells.

The effects of new cells are widely discussed by neurologists. The nerve cells are the most precious, fragile and irreplaceable in our bodies. It appears that damaged nerve cells are usually incurable. Yet, in certain cases, improvements are observed. Numerous cases of epilepsy, for instance, have been improved—with a diminution of usual medication—by injections of placenta, hypothalamus, amniotic liquid and frontal cells. One patient, previously suffering from daily attacks, has not had one for six months. Another, in a condition of almost continual attack for months, now suffers only one attack every other day.



Ménière's disease	Hypothalamus and adv. placenta cells.
Insomnia	Hypothalamus and adv. placenta cells.
Migraines	Hypothalamus and adv. placenta cells.

### *Skin Diseases*

Chronic eczemas	Pre. placenta, suprarenal and foetal hepatic cells.
Senile pruritis	Adv. placenta cells and corresponding genital-gland cells.
Leg ulcer	Adv. placenta, corresponding genital-gland cells, foetal hepatic, foetal spleen and foetal skin cells.

Skin diseases are among the most discouraging. This is an area requiring a new therapeutic approach.

Cellular therapy possesses in this area an interesting honors list. Eczema is often improved by liver (or gastric mucous membrane), hypothalamus, pituitary and suprarenal cell injections. One must allow for occasional relapses and administer booster injections. Nevertheless the exudative forms are more easily cured than the chronic forms.

Good results have been obtained in cases of elephantiasis.

Acne also seems susceptible to treatment by new cells, and certain kinds of baldness as well.

Non specific pruritis is often cured by a single injection of hypothalamus cells, as are certain erythematous dermatoses.

### *Various Ailments*

Albinism through lack of pigment	Foetal pigment cells from the skin, iris, and retina.
Albinism through incapacity to expose the pigment cells present	Cells from the middle layer of the pituitary in young animals of black color.
Precocious whitening of the hair following fear	Hypothalamus and pigment cells.
To activate callus formation	Osteoblasts and corresponding genital cells.

This list is not complete. Certain ailments do not figure on it in the treatment of which, however, cellular therapy has recorded successes. In his book, Dr. Niehans gives another classification, by organ, from which the following list will supplement the first.

#### *The heart*

Cardiac muscle cells have been successfully injected in cases of:

Excessively small heart;

Cardiac muscle lesions (following irrigation difficulties because of coronary lesion);

Degeneration of the cardiac muscle;

Cardiac weakness (a heart prematurely tired can be restored by a selective cellular therapy);

Cardiac atrophy.

*Asthma*

Interesting improvements have been recorded in many cases. Statistics: in thirty cases treated, twenty-six asthmatics have remained completely free of attacks for ten months, and in many cases this treatment was given to victims of inveterate asthma that had lasted years, in some cases twenty to thirty years. A Parisian doctor cites the significant case of a woman of fifty-two, subject to attacks for thirty-two years, who had suffered a serious pulmonary embolism a year before and whose proneness to attacks had made her unable to lead an ordinary life. She regularly suffered seven or eight attacks a day, three or four at night, always keeping a tank of oxygen at her bedside.

On June 1, 1953, she received injections of suprarenal and hypothalamus cells. She had one more serious attack five days later and suffered a buttock discharge which had to be punctured, but no further attacks for two months. She has since gained fourteen pounds and resumed her normal activity: aside from several attacks of bronchitis during the winter, she regards herself as totally cured.

On the other hand, certain asthma cases resist all cell injections.

In afflictions of the cardiac rhythm, hypothalamus cells are most frequently called for. The spasms are influenced by cells from the placenta and corresponding genital gland.

One case cited by Niehans: N.O.R——, born in 1898, cardiac sclerosis with edema.

Treated in July of 1940 with cells from the foetal cardiac muscle and kidney. Result: major palpitations and edemas disappear.

### *The liver*

Foetal hepatic cells are injected in cases of:

Insufficient bile secretion;

Chronic hepatic disturbances (hepatosis, atrophy of the liver);

Hepatic lesions;

Certain allergic conditions (asthma, hay fever).

Suprarenal cells are then also injected;

Certain dermatoses.

### *The stomach*

Niehans injects foetal gastric mucous membrane cells in cases of:

Acidity;

Anemia;

Stomach ulcer (the injection then also includes cells from the hypothalamus and the suprarenal cortex).

### *The kidneys*

The renal cells (in combination with placental cells) have beneficial results in:

Chronic nephritis;

Nephrosis;

Nephro-sclerosis.

### *The spleen*

Foetal spleen cells are injected in all cases of the lesion of this organ.

Furthermore, Niehans advises this treatment in cases of terminal cancer.

### *The bones*

In certain bone diseases, Niehans suggests injections of bone cells (osteoblasts) obtained by scraping a surgical spoon across the foetus's fontanel.

For the teeth he prescribes a similar treatment. "Why," he writes, "would dentists not succeed in treating cavities by osteoblasts and in filling lacunae in dentition by including dental pulp cells?"

In 1932, Niehans himself successfully performed a dental transplant; for nineteen years the organ has fulfilled all its functions.

### *The nervous system*

The brain of an adult human being contains an enormous number of cells, each of which has its own particular task; each deficiency involves a stoppage of the corresponding functions. In this delicate region, injections of foetal brain cells taken from numerous glandular centers have achieved striking results. Corresponding cells of the damaged area (frontal cells, for instance) or of the insufficient gland (thalamus, hypothalamus, etc.) are injected.

### *Ailments of internal-secretion glands*

Niehans has indicated that the endocrine glands

of our body are already in action for the formation of the spermatozoon and the ovum. They function during the embryo's entire life, and then from birth to death.

They influence each other reciprocally, which explains that in cases of endocrine ailments, cells of several glands are always injected together.

Many afflictions are improved by injections. Niehans injects foetal pancreas cells in cases of digestive ailments of pancreatic origin.

Pancreatic sugar diabetes (here, only human foetuses, rich in B cells can be used).

An example: M.F.A.—— (born in 1894). Pancreatic sugar diabetes. Without twenty units of insulin a day, the patient shows a sugar percentage of 200 milligrams in the blood and 4.2 grams in the urine.

Preserved pancreas cells of a human foetus are injected. Virtually absolute cure: without diet or insulin, the patient is in good health.

"I cannot think," says Niehans, "of all the surgically removed human embryos without a pang. Each time one of them is destroyed, a diabetic is being deprived of a cure, condemned to insulin. . . ."

#### *Revitalization and Rejuvenation*

"The sexual glands," Niehans writes, "contain incalculable riches. Each conception puts into play twenty-five million vital units in man. The female

ovary sometimes forms seventeen thousand follicles, of which only one reaches maturity. Not only are the sexual glands the formation center of the spermatazoa and the ova, their secreting cells are a rich source of vital solutions dispensing physical strength and mental alertness. They revitalize the organs weakened by age."

Niehans injects two categories of cells together: The Sertoli cells (which are found in the tubules of the testes) play an extremely important role in our organism (oxidation, blood irrigation, etc.); the Leydig cells) found outside the seminiferous tubes).

Many ailments can be effected by this treatment. The following case, cited by Niehans, gives an idea of the particularization he has achieved:

M. H. E.——, born in 1907. Nicotinism (chain smoker).

Treatment: New cells from a young testicle, suprarenal cells, hepatic cells.

Result: The injections cause the desire to smoke to disappear.

But the classical observation is of this type:

Monsieur J.-C. L——, age seventy-one. Period of depression. Work capacity diminished. Impotence.

Treatment: Young testicle cells and placenta cells.

Result: Recovery of potency and libido. The number of spermatazoons increases.

Niehans obtains equally impressive results in treating women, particularly in certain cases of sterility, in which he injects cells from the yellow body and vital follicular cells.

The revitalization treatments are organized around genital cells, to which placenta cells are generally added. Niehans particularly strives to eliminate by this means the arteriosclerotic modifications of the brain.

In the ensemble of cellular therapy, one should notice the somewhat special use reserved for placenta cells. They are involved in most revitalization treatments as well as a large number of others.

The placenta exceeds qualitatively all other internal secretion glands, forming male and female sexual hormones, pituitary and suprarenal secretions, apparently possessing stimulating properties with regard to other organs.

It appears that placenta cells activate other cell injections. They are therefore almost always associated with the liver and the spleen, the stomach and the sexual cells.

Injections of these seem to activate the formation of scar tissue in wounds.

At this level, cellular therapy coincides with Filatov's therapy of placental implants (see Chapter IX). Combined cures have been affected, during which placenta cells were injected daily (Niehans



method) and implanted in the tissues every ten to fourteen days. This alliance of the two techniques has produced the following statistics:

20 advanced myopias out of 21 improved

20 retinitis pigmentosa cases out of 22 improved

19 out of 22 cases of atrophy of the optic nerve improved

1 iridocyclitis improved

1 chorio-retinitis improved, but only on condition that the treatment be continued over a long period.

Good results have been recorded in certain hearing ailments (20 cases of hypoacouses improved out of 50 treated). No results, however, in cases of complete deafness.

The findings of the observation clinics seem to indicate, all the same, that results are more convincing in patients without serious organic lesions. In certain cases of precocious senility, that is, in subjects who feel "finished," "exhausted," "empty," at approximately seventy years of age, the injections have actually wrought a new youth. When, in addition to this general revitalization, the cells must restore a particular organ (heart, kidney or liver, for instance), the rate of success is less spectacular. The fact remains, nevertheless, that new cells indisputably constitute a precious weapon against old age.

“What I hope for,” Niehans has written, “is not only to increase the number of years but also to provide those years with an enlarged capital of real vital force. By cellular therapy, science puts a new life capital at the disposal of the aged.”

## *The Case for the Prosecution*

If positive evidence of patients cured or improved is difficult to assemble, the same is true of negative evidence. Many doctors who declare that cell injections have no effect are incapable of furnishing a precise clinical case.

There is, however, in Paris, one elderly lady who has not hesitated to speak against new cells. She has addressed several letters of protest to doctors who incline toward cellular therapy (for instance, when their patients appear to resist all orthodox therapy).

This woman accuses fresh cell injections of having hastened—if not provoked—the death of her husband, a lawyer suffering for many years from angina pectoris. He had survived an infarct of the myocardium three years before, but on the advice of one of his friends, a lawyer like himself, he had cells injected: A cure of arterial tissues and revitalizing cells of various glands was administered, despite the in-

sistent warning of his own doctor. The lawyer was expecting a miracle from these injections. They provoked, first of all, a large abscess which had to be opened. Then, several days later, occurred a serious attack which was to cause his death. His wife is categorical: the cells provoked this mortal attack. She claims that the subtle equilibrium established in the disease, was destroyed by the addition of these new tissues. According to her, if her husband had not undergone this experiment, he would have been able to live much longer.

The woman's unfortunate story, whether or not one attributes a conclusive value to her words, illustrates one of the chief criticisms made with regard to Niehans's injections: in certain predispositions, they may be followed by shock whose violence is unpredictable, given our present state of knowledge.

Many doctors who have not delved deeply into the study of cellular therapy warn: "There have been accidents!"

Niehans is reserved on this subject.

In a recent conference, one of the most active French cellulo-therapists furnished the following statistics:

"We have treated approximately 2,000 patients, administering nearly 4,000 treatments and more than 15,000 injections. We have had some accidents, rea-

wakenings of local infections, resorption difficulties, abscesses which had to be drained.

"We have had, unfortunately, 18 cases of death, 4 during the week following the administration of new cells, 14 during the week which preceded it, including 3 infarcts the day before treatment, which goes to show the absurdity of these figures.

"Our four cases of death following the injection of new cells include an acute edema of the lung in a patient suffering from cardiac insufficiency and having already had three infarcts and two edemas of the lung during the administration of intravenous anesthetic. The second case concerns a severe senile myocardial fibrosis. We have learned that on the day before the treatment the patient had had a prolonged syncope which was renewed the day after treatment, this time terminally. The third case concerns a Mongoloid child suffering from an extremely abrupt rise of fever thirty hours after treatment. We were dealing—as we discovered later—with a child suffering from encephalitis; our "stress" probably provoked a considerable rise in temperature. We were not able to save the child. The fourth case is that of a myocardial infarct—in this case the patient's own doctor committed serious therapeutic errors. The circumstances did not permit dealing in time with the acute edema of the lung which occurred."

This frank account permits us to formulate the following conclusions:

Of the four patients studied, the first two would have died in any case. The only error of the cellulotherapists was to treat them at all.

The case of the Mongoloid child proves that an extremely thorough clinical examination is indispensable. (Subsequently, tests on patients were extended.)

The last case is not imputable to cellular therapy.

There remains, nevertheless, the fact that the therapeutic action of new cells is not absolutely without risk.

With the foreign tissues, antibodies are necessarily injected. And it must be admitted that a reflex shock, although rare, is always possible. Such threat exists, moreover, in every method which implies the injection of foreign antibodies into an organism. The malfunctioning of the kidneys is, for instance, a very precise counterindication. The same threat exists even with regard to orthodox vaccination. Nephritic patients are never vaccinated. And the risk is such that this ban applies even in time of epidemic.

If the threat of allergic reaction to the foreign albumen, which hung over Niehans at the beginning of his career, today seems sidestepped, the suspicion of the "reflex shock" seems to have replaced it.

This is actually only a secondary aspect of the case

presented by the adversaries of cellular therapy. Their argument rests primarily on cancer. It is from this point, solidly entrenched, that they fire their shots at Niehans and his adepts.

No one knows all there is to know about cancer—or cancers.

There exists a rather recent theory which defines certain cancers as a belated—an anarchic—proliferation of the embryo cells which each of us carries in his organism all his life. There are foetal cells which have not developed, and which suddenly begin to resume their growth period during some hormonal disorder (menopause or andropause, for instance). Cancer, according to this theory, would merely be a kind of frantic growth belatedly awakened by a series of still little-known agents.

Certain recent observations have encouraged this theory. Much has been made of the case of twin sisters who, after seventy, were both affected by the same type of breast cancer at the same time. A coincidence perhaps. If not, the same cancerous manifestation, appearing at the same time in two identical beings (they were identical twins, of course), seems to support the so-called “embryonic theory”: the development of the twins being strictly parallel, the cancer must have “pre-existed” in order to appear simultaneously in the two organisms.

The progress made in the microscopic analysis of

cancerous tissue (biopsy) provokes an increasingly frequent appearance of cells of the "embryo type." There is nothing new about this. Every doctor knows that lost among our trillions of cells are cells of this type, which may awaken on occasion. In certain cysts, rough drafts of human embryos are often found—hair, teeth or bones which seem to be an absurd attempt to produce life under impossible conditions. In leukemia, which some call blood cancer, the malignant cells which destroy the bone marrow are indisputably of the embryo type. Some doctors wonder if adding animal foetal cells to the organism might not risk awakening these human-embryo cells which have been neutralized within the organism; or even, by introducing animal embryo cells, thereby admitting a somnolent enemy that may someday awaken.

For these critics, the fact that the injected cells are taken from animal and not human embryos is no guarantee. There is in every embryo cell—it is believed—a kind of vital impulsion, a force which permits it to pass beyond the frontiers of species or genus. Bone marrow from rats has been successfully implanted in mice that have received mortal X-ray doses! The French embryologist, Étienne Wolff, has recently shown that one may associate fragments of organs taken from species as different as the chicken and the mouse: they grow together and build surprising common structures, such as combined bron-



chioles of hen and mouse in which the cells of both species are regularly arranged, one beside the other, acknowledging their consanguinity.

This chemical analogy of cells of different species may be an argument in favor of the cellulo-therapists. It may also work to their disadvantage, for it opens the door to the alarm signals of the cancerologists, who point out that the injected embryo cells are undifferentiated and therefore more likely than the rest to dislocate the subtle human cellular mechanism. This is the thesis, in particular, of numerous American investigators who declare themselves unconvinced by Niehans's statistics, according to which the patients who have undergone a revitalization treatment at the critical age escape cancer attacks. They emphasize the fact that in the best of cases these valid statistics are limited to some twenty years. The processes of cancer—which defy human analysis—also defy human notions of time, and nothing proves that the disease—once generated—is not transmitted from generation to generation. So long as they do not possess precise studies, satisfactory explanations as to the mode of action of injected cells, the itineraries followed within the body, and the causes of these migrations, the American investigators seem determined to maintain their quarantine.

The theory of the cellulo-therapists is that there exists a specific action, controlled by a homologous

attraction of the injected cells with those of the receiver. Recent researches have supported what was merely a hypothesis: the American embryologist, Holtfretter, has brought to light the affinities, the attractions, and also the repulsions which exist between the embryo cells, resulting in the construction of an organ instead of the proliferation of a chaotic mass. He has mixed together various cells taken from a batrachian embryo and observed that these mixed cells regroup themselves by family in order to form rudimentary organs.

Pushing his experiment still further, Holtfretter has shown that there also exists, between two cells of a different type (such as epithelial cells and nerve cells, for instance), certain repulsions which keep them apart.

The Israeli biologist, A. Moscona, has also recently devoted his attention to the problem. He has managed to disintegrate the more highly evolved organs of the chicken embryo, dissociating and then mixing cartilage cells and embryo kidney cells. He has placed them in a culture and observed an extraordinary phenomenon: spontaneously, a kind of selection occurred, each of the cells reconstituting the organ from which it was taken, in this case cartilage rods and embryo kidney canaliculi.

All these experiments merely make clear what has been known since Carrel: that mysterious forces

exist within the cells. For the American critics, they in no way explain the mode of action of fresh cells within our organism, and as a matter of fact, the cellulo-therapists themselves are divided on this subject. They offer to the criticisms of the cancerologists a file crammed with experiments and observations that are sometimes contradictory.

Niehans holds that the complex interplay of biological attractions draws a particular cell, in its totality, toward its diseased twin. This voyage can last as long as four days. Niehans frequently cites an experiment performed at the Heiligenberg Institute in Germany. Colored cells from which, during four consecutive days, the dye substance was gradually and totally eliminated, were injected and observed. This substance was found not agglomerated, but arranged in lines indicating the cells' intineraries.

Niehans has insisted on the natural character of these migrations. Mobility, according to him, is one of the fundamental properties of cells. It is easy to imagine these displacements if we do not forget that the entire organism is constituted, to a large degree, of a coherent liquid solution. This organism is itself rich in migratory cells. The movement starts at the beginning of the foetal development: certain cells—the amebocytes—move at the rate of one millimeter an hour. Under the microscope, numerous cell displacements have been observed. Having reached the

end of their journey, the cells integrate themselves with the work community on the spot. But they can also be seen leaving again to move off toward damaged organs whose re-establishment requires their presence.

In an explicit phrase, Niehans sets forth his position: "The cells enclose nuclei, chromosomes, granulations, mitochondria, protoplasm, and many other formations as well. There have been many efforts in recent years to isolate their active substances and to inject them. Efforts which have proved quite useless, for the results obtained by starting with the cell itself as a unit are superior. . . ."

For Niehans, therefore, it is the entire cell which acts, drawn toward the homologous organ by virtue of a fundamental biological law. In no case, he maintains, can these new cells have a dangerous action. Far from disturbing the natural movement (as the cancerologists fear), they integrate themselves with beneficial effect. But this theory does not appear convincing to its detractors.

Niehans's students agree with his conclusion, though in most cases they reach it by a different route. They, too, energetically challenge their critics, but they maintain that it is not the entire cell which travels through the body. The cell is content to send its cargo, as a reinforcement and at slow

speeds, toward the diseased cell; such cargo is called mitochondria. Recent experiments in Heidelberg have developed this point of view. The play of attractions and repulsions ultimately affects only the mitochondria of the cells injected toward the corresponding mitochondria.

Yet why? It must be admitted that at this level of knowledge of human matter—at the level of the mitochondria—our information is still extremely vague. It is upon this point that the adversaries of the method rest their case: for them, the cellulotherapists are guilty of provoking phenomena which they cannot explain. So long as they have no precise theory, they will remain in quarantine, accused of sowing unknown disturbances in the delicate society of the cells. Despite their file of cures, what is there to prove that they are not carrying arms—unaware of it themselves—to the cancer agents concealed deep within the organism?

Here is where the discussion ends. The adversaries remain solidly entrenched in their positions. So far as cancer is concerned, the debate has not progressed far.

“But this is too dangerous a zone, the risk is too great for us to neglect a single safety measure,” an American biologist has written.

Agreement will not be reached tomorrow.

There remains still another delicate point where the adversaries meet face to face. This concerns the effectiveness of new cells. For many critics, cellular therapy is without danger; there is no reason to be against it. But there is also no reason to be for it. It is of no use whatsoever.

There are failures—more numerous than the cellulo-therapists admit.

A year ago the most famous French television producer, Jean Nohain, suffered a serious depression attack. Nohain is an active, nervous man, a tremendous worker. The responsibility for several major programs weighs upon him. For several years he has had to struggle against fatigue and has adopted the habit of disappearing into a clinic for one month a year. This time, he felt that his rest cure would not be enough to put him back in the saddle. A friend mentioned cellular therapy to him.

He received injections after an extremely careful biological study, which defined those organs particularly exhausted within his organism. Jean Nohain is a naturally curious man. He is, besides, a man of the radio and television world. He could not keep from questioning the doctors and nurses surrounding him: "But just how does it work?"

Probably hesitating to increase his fatigue by explaining in detail the varying theories of elective

tropism—whole cell or mitochondria—his doctors informed him that it was not precisely known how the cure functioned. And this reply made him wonder: "I suppose," he declared, "that medicine hasn't made much progress after all."

Whether it has or not, the injected cells in no way improved his condition. He suffered great pain at the injection point and left the clinic more exhausted than upon his arrival! (From the latest information, we have learned that Jean Nohain has decided to attempt a new cell experiment. He has not been discouraged by this first failure.)

Nohain is not the only patient to protest against the lack of effectiveness of the injections; numerous complaints have been received on this score: "It didn't do me any good!"

One retired businessman living on the Côte d'Azur has spent all his savings for cell injections; he has not found his condition improved and is full of abuse concerning the treatment. One extremely ill old lady begged her doctor to recommend her to the cellulo-therapists. At first the latter refused to accept her case, but upon her insistence, they at last capitulated. Her case is at a standstill, she has no more money. A young man, an adding machine salesman, declares that he, too, has been "robbed." A friend had mentioned the miraculous treatments to

him. He went to Switzerland, received injections in Niehans's clinic, but his diabetes is just as it was before. He has not diminished his insulin doses: "I saw my friend again," he says, "and although I did not reproach him, I questioned him a little more carefully. I have reached the conclusion that his own condition had in no way improved. He *believed* he was better: he was the victim of the phenomenon of autosuggestion."

This is another rather frequent criticism. To it the cellulo-therapists oppose the experiment of Dr. Phillippe Janson.

Dr. Janson worked with twenty-five men between sixty and seventy years of age of a comparable social level and having the same opportunities for rest. None of them offered morbid symptoms. Each spoke of great weariness, a need for sleep, a lowering of tension, and a loss of potency. A certain diminution of intellectual faculties was common to them all. Each man seemed on the verge of the period of senescence, at the threshold of old age.

Dr. Janson set up three observation periods: the first dedicated to a study of each case with no therapeutic action; the second consisting of four weeks of psuedo-treatment, with injections of distilled water. The third, beginning with a single—and unique— injection of new cells from sexual glands, was followed by three months' observation.



Naturally, the subjects of the experiment thought they were receiving cells at each injection.

Unanimously, the twenty-five subjects, who underwent an entire series of tests during the first period of observation, showed no modification during the second when each of them received twelve injections of 5 cm<sup>3</sup> of distilled water.

In the third period—that is, after having received cell injections—they showed marked modifications between the second and the fourth week, after the single transplant.

In fifteen cases, no modification of weight; in ten, diminution between three and five pounds. In the twenty-five subjects under similar checks, a diminution of the free and total serum cholesterol. The level of cholesterol did not rise again during the entire third observation period.

During the first two periods, no modification of pulse frequency and blood pressure was recorded. On the other hand, distinct modifications were noted during the third period.

Special tests permitted the measurement (within the customary limits) of the transformations of intellectual aptitudes. Specialists had perfected a series of problems adapted to the knowledge and culture of each subject at his own level. During the first period of observation, the twenty-five subjects offered solutions, after long protests, that were almost

always (in 65 per cent of the cases) false. The time it took to offer these solutions was much longer than normal.

The same phenomenon occurred during the second period of injections of distilled water.

The examination of the intellectual faculties in the third period was begun only three weeks after the injections had been made. An improvement was apparent in certain of the subjects, as much in the exactitude of the solutions as in the time it took to reach them. The improvement could be calculated at 25 per cent.

Dr. Janson formulated his conclusion as follows: "I am aware of the fact that during my examinations and tests, only a few factors and a few exterior manifestations of the entire psychosomatic personality could be grasped, but the conformity of the results, nevertheless, permits us to conclude that the cells from sexual glands have had a real action—and not a psychological one. This factor has been avoided by the arrangement of the experiment itself."

Dr. Janson's test does not prove that certain cures recognized as such do not have a purely psychical origin. Such cures certainly exist. There is the case of a retarded boy who, after each cell injection, gave evidence for a few days of some gleams of intelligence. Unfortunately, it appeared impossible to maintain the improvement. The doctor replaced a

cell injection by one of distilled water and the same phenomenon occurred—just as fugitive as usual—but no more so.

There is doubtless a psychological factor in each new-cell cure, but this is true of any therapy. That is why the adversaries of new cells prefer to base their accusation on the other elements of the file, such as the effect of shock and the risk of cancer, which seem to them more significant.



PART III

*Conquest of Age*



## *The Secrets of Rejuvenation*

PARTISANS and adversaries of cellular therapy are in agreement on only one point: injectable cells constitute the latest form of experiments which reach back as far back as medicine itself.

Niehans's name is the last on a considerable list of scientists, generally doctors, who believed they had found in the addition of new tissue the secret of rejuvenation or recovery.

Since ancient times, the beneficial effect of the incorporation of organs taken from young and vigorous bodies has been assumed. The principle established, innumerable efforts have been made to define its practical applications.

In one of the oldest medical documents known, the Ebers Papyrus, discovered in Egypt, are given formulas for several preparations consisting of healthy organs (though the notion that the patients of antiquity had to swallow them is disquieting!). Grafts of

a special character were supposed to accelerate the processes of cicatrization.

Five hundred years before Christ, a famous Tibetan doctor prescribed an extract of young tiger glands as a remedy for impotence. He also declared he could rejuvenate old men by products consisting of heifer foetus. Aristotle's *Materia Medica*, and the writings of Pliny, the Elder, make considerable mention of various organ grafts. Finally, to conclude with a literary reference, does not Homer describe Achilles devouring a lion's heart to increase his strength, his endurance, and his courage?

In the sixteenth century, Paracelsus had as his motto: "*Similia similibus curantor.*" He wrote: "The heart cures the heart, the kidney cures the kidney." In 1771, in England, Hunter, inaugurating the long series of practical studies, grafted rooster testicles into a castrated specimen. The latter, for a time, recovered its original vigor. Berthold, in 1849, continued these experiments in Germany. When medicine, toward the end of the last century, became aware of the extraordinary importance of our glandular system, investigators penetrated still deeper into the study of grafted organs. Charles Brown-Séquard and Voronoff after him constructed excessive theories on results which the future was to contest: their visions of eternal youth inflamed mankind's imagination. Later, when the fire had died down,



laboratories the world over resumed the thread of their studies.

Meanwhile, the results of Carrel's famous experiment had been made public.

At twenty-one years of age, in 1894, the young interne Alexis Carrel had witnessed the assassination of Sadi Carnot. At the Lyon hospital, surrounded by his colleagues, he had watched the President's agony, powerless to act: Caserio's dagger had cut directly through the portal vein, and at the time even the greatest surgeons did not know how to suture an artery.

"I shall do something, I shall manage it," Carrel swore to himself. And he kept his word.

For many years he is to spend his evenings in a Lyon embroidery shop, doing needlework of an almost unimaginable delicacy. Several years later, he succeeds in performing the first suture of a human artery. The Rockefeller Institute immediately offers him a position in America, where immense means will be put at his disposal. He accepts and announces that henceforth his sole concern will be the prolongation of life. In 1912 he establishes himself in the Institute's laboratory, the most luxurious he had ever seen, whose windows overlook the black waters of the East River. He sacrifices a chicken, isolates its heart by a series of anesthetic operations (which have since been repeated only very rarely), manages to

integrate it into an aseptic medium, and begins his survival experiment.

Carrel's chicken heart will live until 1939, the date when it was decided to kill it, the experiment having been studied in all possible aspects. At the same time, Carrel has kept alive a cardiac-tissue culture, and during this experiment it was discovered that the tissue not only lived, but was in a state of growth. Carrel calculated with astonishment that if he had not daily destroyed some of the culture, it would have covered the entire surface of the earth in twenty years.

Many young doctors of the period, like Niehans, studied the conditions in which Carrel set up his experiment. He had unceasingly "fed" his heart with new chicken-embryo cells. At the beginning, his physiologically "dead" heart had resumed its beating when the first *embryo* cardiac tissues were introduced. Subsequently, the cells assured its nourishment and guaranteed its definitive youth.

Niehans believed that extremely aged tissues, no longer growing, would be similarly excited and perhaps roused to a renewal of growth by the addition of embryo tissues of the same nature. Everything seemed possible in this marvelous universe of cellular life. Certain experiment reports read like poems. In one, Carrel brilliantly demonstrates the cell's extraordinary faculties of adaptation: tiny fragments

of chicken heart were detached. At first the fragments remained motionless in the culture medium. A strict alimentation of the medium by the addition of embryo cells caused apparent rhythmic movements to appear on the sixty-fifth day.

When Carrel brought two of these fragments, beating at different cadences, near one another, they united and began to beat with the same rhythm!

The German biologist, E. Knake, performed another demonstration of this extraordinary "will to live" enclosed in each tiny cell. Knake pressed an embryo through a fine network, thereby naturally destroying it as a vital unit. He obtained a quantity of cellular islands, the quotient, so to speak, of the vanished promise of life. Yet each island seemed to be endowed with a life of its own! Transplanted to an appropriate nutritive medium, even to a heterogeneous plasma, the cells continued to live. Better still, they developed, remaining in a state of definitive youth, although the embryo had long ceased to exist.

Here the mystery of life itself was within reach. Carrel did not want—or did not dare—to go further. Aided by Charles Lindbergh, he worked thereafter on a concrete application of his studies: the artificial heart. The strange four-bottle machine which they presented to the Biological Congress in 1936 was to revolutionize surgery, but Carrel had already

plunged into philosophic meditations, leaving the problems of extending his research to younger men.

As soon as Niehans had chosen his path, he no longer hesitated as to a field of specialization: a surgeon himself, he would devote his life to the culture of tissues and the grafting of internal-secretion glands.

It was in 1857 that Claude Bernard created the expression "internal secretion," foreseeing the enormous importance of our secret glandular system and setting off the formidable hormone "race" which was to transform medicine.

The term "hormone" comes from a Greek word which means "to excite." In 1914, the English biologist, E. H. Starling, gave the following definition: "By the term hormone, I mean any substance normally produced in the cells of any part of the body and transmitted by the bloodstream to other regions on which it acts for the good of the entire organism."

Human hormones are innumerable. Even today only a tiny portion of them is known—and the greatest specialists are still divided on this point: does the human heart secrete them or not?

On the other hand, virtually all the secrets of the sexual hormones, growth hormones, and those of the pancreas (insulin) have been penetrated: new hormones of the suprarenal glands continue to be discovered every day and new responsibilities for each

new hormone are envisaged (a recent theory maintains that there is even a hypertensive hormone). Synthetic hormones have been manufactured to compensate for the inadequacies of certain glands. . . . Endocrinology, as everyone knows, has made tremendous progress and its medical triumphs are many. The results are all the more striking considering the intricate complexity of the system.

One example: not long ago the role of hormones in the transmission of nervous excitation was discovered. The nerves are excited by hormones which are found in the blood in the proportions of one thousandth of a milligram per liter, and yet two such hormones have already been isolated (acetylcholine and sympathin). But it has taken almost a century to achieve this level of research.

And the intermediate levels are strewn with failures. And false hopes as well. For the discovery of the role of the internal-secretion glands soon appeared to some as a promise of eternal youth. Having identified the glands, analyzed and studied their role, had not man at last seized upon the instrument of his great dream? Henceforth it would be enough to graft, to implant, to renew. And death itself would retreat. . . .

Great minds caught the fever. The first was a bearded giant from the island of Mauritius, the celebrated Brown-Séquard. He was seventy-two years old,

when he succeeded the famous Claude Bernard at the Collège de France. An extremely large audience filled the amphitheatre. Brown-Séquard's reputation was such that a spectacular statement was expected. There was not long to wait. Of tremendous stature, his skin swarthy, a dark fire in his eyes, Brown-Séquard mounted the platform and even before sitting down declared, "Before beginning, I shall speak of my latest experiments. . . ." He paused for a moment. "I am seventy-two years old. My natural vigor has declined considerably in the last ten years. I have perfected a liquid taken from the sexual glands of living animals or of animals on the point of death. I have injected myself three times. Today I was able to *pay a visit* to young Madame Brown-Séquard. . . . I have rejuvenated myself by thirty years."

Within eight days all of France had read in the newspapers that a scientist of British origin who had spent part of his life in America before settling in France had discovered a *glandular juice* which effaced the ravages of time. The members of the Société de Biologie, who had listened half dozing to the résumé of his studies, suddenly woke up when they learned what his practical conclusions were. (The average age of the members of the Société de Biologie was seventy-one!)

During his second lecture at the Collège de France,

a number of attractive women, trembling with emotion, were scattered among the cacochymic old men, stage stars and famous lawyers. Several students had managed to slip into the amphitheatre. One witness has described Brown-Séquard as follows: "He is tall, his hair and beard are thick, his skin swarthy, and his eyes brilliant. He speaks with a strong and convincing voice. His appearance is both fascinating and monstrous. . . . His gestures are lively, somewhat abrupt. From time to time he tosses his head impulsively. He wears an elegant black frock-coat with a striped tie. Oh, I was forgetting—he is old!"

Here is how Brown-Séquard began his lecture: "I have always thought that the weakness of old men was partially due to the diminution of the functioning of their sexual glands. I first hoped to succeed in injecting sperm directly into the blood. This treatment would have rejuvenating effects, but extensive study with animals has set me upon a different track. There is another means of introducing extracts from sexual glands into weakened organisms!" Brown-Séquard paused. He leaned down and took hold of a tiny vial which he raised at arm's length. "Here is a liquid which I have manufactured from sexual glands of living animals. I have tried it first on old dogs and obtained decisive results. Subsequently, I have experimented on myself. I have already told you what the consequences were!"

The public's excitement was followed by delirium when the press reported that Brown-Séquard had solemnly sworn never to *sell* his miraculous liquid, refusing to associate the commercial spirit with the promises of eternal youth. He would distribute his elixir gratis to all those who asked him for it. With a little patience, each would have it in his turn. The first patrons were already presenting themselves, upon recommendation, at night, slinking along the walls. Brown-Séquard had taken as his associate another doctor, D'Arsonvel, with whom he had perfected a fantastic machine, defying the imagination, which would night and day secrete glandular juice by means of tubes, conveyor belts, dials, retorts, palpitating bladders, and diabolical flashes of light. It is known today that Brown-Séquard utilized sexual glands and seminal vesicles taken from bulls. This matter was pulverized, filtered through sand, ascepticized by boric acid, and injected into the buttock. Very soon the demand surpassed production. The press became involved: *Le Matin* opened a subscription to construct a rejuvenation institute and to provide an income for the two benefactors. But with the first fruits came the first criticisms. The youth of Dr. Faust was only an illusion, the effects of the "invigorating" liquid were merely temporary and became increasingly fugitive upon the following injections. There were secret communications to the



Academy. Very soon the public at large turned away. Yet the old scientist clung desperately to his discovery despite the indifference, the scorn, the hatred which mounted around him. It was impossible to forgive him the enthusiasm and the disappointment he had provoked. Since he had not found the secret of eternal youth, he was, in the public's eyes, worth nothing. His ideas concerning the endocrine glands were those of a genius, yet he encountered only hostile faces. He had promised too much, and he would never be pardoned such illusions.

"I foresee," he wrote, "a new therapy. Serums—lung serums, brain serums, liver serums—against the weakening of these organs."

All endocrinology is substantially to be found in these notes made at the end of his life. Niehans, later on, was to lean attentively over these chaotic remarks illuminated by flashes of genius.

Denied, jeered, abandoned by his friends—by his wife—Brown-Séguard was to disappear without being able to formulate his last ideas. But before dying from a cerebral hemorrhage in Menton, where he had taken refuge, he was to indicate the path along which investigators were henceforth to continue.

Among the careers he inspired, there is one whose contour will recall to a striking degree his own.

Like Brown-Séguard, Voronoff was born far from Paris and his biographers have never cleared up the

mystery that surrounds his youth. Like Brown-Séquard, Voronoff possessed a magnetic gaze beneath thick eyebrows, a thundering voice, a theatrical manner.

He, too, was to promise humanity eternal youth—and his fiercest partisans never forgave him for having betrayed their hopes.

It is in Egypt, ten years after Brown-Séquard's death, that the role of the endocrine glands in the human organism is revealed to Voronoff, who is the Khedive's surgeon. One day he is called to the seraglio, where the sovereign's favorite eunuch is suffering a cardiac attack. The subsequent events can be imagined. Having become the preferred doctor of the corps of eunuchs, Voronoff makes fruitful observations and gradually, by a sort of negative reaction, checking off all the physiological and psychological weaknesses of these half-men, he acquires the conviction that the very principle of life is to be found in the sexual glands. His master, the famous Péan, who performed operations in his street clothes, the inventor of the Péan forceps, had read Brown-Séquard's works—which had not yet been passed on by orthodox science—and had studied in detail the problems of the thyroid gland in which he had already instructed his pupil.

Returning to Europe, Voronoff, in his turn, decides to devote himself to the grafting of organs. A

remarkable fate awaits him. For several years his popularity is to be enormous, to such a point that an apprentice dictator, Benito Mussolini, conducts his entire propoganda campaign on the theme: "I shall be the Voronoff of Italy!" Brown-Séquard had been drowned in ridicule. Voronoff will be entitled to ten years of jibes, but he will have had the sagacity, meanwhile, to marry an American millionairess considerably older than himself, who at her death leaves him an enormous fortune.

"Voronoff's most successful operation!" murmurs one jealous colleague.

At almost seventy he marries again—this time a young Roman beauty of twenty-four, a cousin of King of Rumania. These varying conjugal experiences have permitted him, at the very least, to raise himself above a public which will not pardon him his excesses.

It is in 1920 that Voronoff decides to make his studies public. The scenario is familiar: he had determined to deliver his first lecture before the members of the *Assemblée de Chirurgie*, which had convened in the great amphitheatre of the *Faculté de Médecine*. In an imposing silence he mounts the tribune. But before he can speak a word, the President of the Congress stands up: "Gentlemen, our colleague Dr. Voronoff was to address us, but I believe that we are sufficiently informed of what he has

to say by the articles in this morning's newspapers!"

White with rage, Voronoff leaves the platform. The usual debate explodes: "They are jealous!" Voronoff thunders. "They are all mediocrities and they react like mediocrities. . . ."

"Voronoff is drunk with fame and money," replies the President of the Congress, Dr. Hartman. "He is a dishonor to medicine!"

Voronoff is not a man to submit to failure. He rents the Institut Marey at Auteuil, and defiantly invites journalists and photographers for whom he obligingly poses with an old man, and old goat and an old ram—his guinea pigs! All three, he claims, have recovered their youth after a graft of monkey sexual glands. Their mental capacities have been similarly improved. The news bursts like a bomb. Everyone rushes to Voronoff. The world over, candidates for grafting form an enormous waiting list. For from the very start, one tremendous difficulty stands in the way of rejuvenation: if the clients appear by the hundreds, it is the monkeys who raise difficulties. All the more since only one species, the African chimpanzee, guarantees the success of the graft. Voronoff works like a madman. He has a law passed forbidding chimpanzee hunting. The British crown and later the King of Belgium give him every assistance in order to capture alive the animals he

requires. Despite the protests of leagues and societies Voronoff cuts, grafts, and grows rich. Since the operation is always a secret one (who would boast of having been treated by Voronoff?), the rejuvenator seems safe from his critics. If there are malcontents, he does not know it. No one ever protests, and his success increases day by day.

He installs a chimpanzee farm in Menton with an ultra-modern delivery room. Each animal has a first name and a family name. When Voronoff travels abroad to perform a secret graft upon some illustrious personage, he selects a companion among his four-handed friends and fills out a registration blank for him at the hotel. Besides these worldly applications, Voronoff has the wisdom to pursue his pure experiments upon animals. He has obtained authorization from the Governor-General of Algeria to work on the three thousand sheep of the official stock. This is a magnificent experimental theatre: Voronoff practices hundreds of grafts on these state reproducers. His results and his observations permit him to analyze further studies with human grafts. The doctors continue to jeer at him, songs are composed about him, but other scientists examine his studies with interest: Édouard Branly, for instance, or the great surgeon, Antonin Gaussat. It is whispered that certain illustrious old men owe him their second

youth. Names are given, as is only natural. The Church, which has hitherto followed these studies with an anxious eye and without its sanction, now takes a step. Voronoff is invited to lecture at the Catholic Institute. His technique of glandular grafting—including the thyroid and suprarenal glands—is extremely advanced. He shows a photograph of a retarded child extremely improved by a series of grafts. He insists on the social role of operations of this kind: "For certain patients with glandular insufficiencies, life is nothing but one long agony. Moreover, the Church has long been concerned with these unfortunates who are burdens to themselves, their families and humanity. Did not the Council of Constantinople, in the year 889, bar eunuchs from the priesthood?"

Asked to publish his percentages of failure, Voronoff is categorical. Fifteen per cent at the maximum. And he announces that this figure will be lowered when he finishes a series of studies on the blood correspondences between animals and men!

The discussion will continue for years, and Voronoff will alternate triumphs (in 1937 Daladier sends him into French West Africa at the head of an official mission for grafting cattle) and failures. In the long run it appears that his new youth has only temporary effects. The grafted patients, after a few days or even a few weeks of euphoria, fall back into

their previous marasmus. Of course, we are in possession of few precise observations.

Voronoff has considerably advanced the operational technique of grafting. His surgical contribution, the fruit of innumerable experiences, is important. Just as Brown-Séquard has given the first stimulus to endocrinology, Serge Voronoff has solved the fundamental problems of grafting. During an investigation in Breslau some years ago, Niehans discovered Serge Voronoff's communications prominently displayed in the library of surgeons who had extended their experiments further still.

If the idea of cellular therapy was born by chance, Niehans, at this moment of his life, had accumulated extensive knowledge of every problem concerning grafting.

General opinion, since this period, has scarcely changed. It is still considered impossible to acclimate in an adult organism an organ taken from another adult, that is, whose cells are differentiated. Everything occurs as if, once past the embryo stage, the cell "personalizes" itself, becomes rebellious to all transfers. The unfortunate experience of Marius Renard, who lived only a short time with a kidney taken from the body of his mother, has confirmed this thesis, as has a recent attempt at a renal graft in the United States, even though unheard-of precautions were taken (sterilization of the bone marrow

to avoid the formation of antibodies). Recently a kidney graft from an identical twin has been successful.

On the other hand, most embryo grafts are successful.

The embryo cell is not yet personalized. It is a pure "will to live." And with it, many things seem possible. Upon this idea, in the light of all preceding studies—and all preceding failures—utilizing the new light shed by endocrinology, Niehans was to launch himself upon his adventure.

Twenty-five years have passed and minds are still divided, but cellular therapy has come a long, long way. It has penetrated everywhere—even where the authorities do not seem disposed to receive it!



# *Cellular Therapy*

## *in France*

IN Versailles, early in the morning, a 2 CV Citroën has just passed through the great gate of the slaughterhouse without slowing down.

Sounding its horn at each intersection, tires squealing on the cobblestones, it whirls through a well-to-do, stuffy neighborhood of hotels with casement windows and secret gardens.

At the wheel is a young man with a bloodstained raincoat. He is a doctor. At the slaughterhouse he has just taken from a pregnant cow, killed two thirds of the way through her gestation period, the large bluish uterus now stowed in a metal box in the back of his car. The embryo, inside the placenta, is still alive. It must reach Vaucresson, two and one-half miles away, in this state, otherwise everything must be done again.

At Vaucresson (Seine et Oise), in the underground workroom of a rest home transformed into a clinic,

doctors and masked, gloved, white-booted laboratory workers stand motionless beneath sterilizing ultraviolet lamps. The scalpels, the pincers, the clamps are lined up on the dissection tables. In a neighboring room which communicates by a glassed-in tunnel with the laboratory, nurses are preparing syringes.

Announced by its horn, the car screeches to a halt before an inclined ramp. The box is placed on a truck. Before entering the laboratory, the porters stand motionless for several seconds on a special carpet that sterilizes the soles of their boots. Finally, the box is opened and the matrix is removed. A doctor incises the envelope spattered with tincture of iodine and collects the amniotic fluid that runs out. Then he carefully removes the amnios, the silky membrane that protects the embryo (long used in orthodox medicine to cover wounds or lesions, the amnios is also used in brain operations).

Through the placenta, whose large whitish cotyledons half as thick as a man's wrist are removed, a palpitating shapeless mass can already be seen. The yellowish body of the ovary is removed. Finally, with the tips of pincers, an embryo the size of a cat is uncoiled, its eyes closed, the tips of its hooves a transparent yellow.

A cry breaks forth behind a mask. "M. . . there are two!"

Two embryos: male twins. The first, spread out

on the operation table, has already been drained of all its blood. With precise gestures the doctor begins to dissect it. He takes several minutes to remove the necessary glands and tissues without damaging them.

In fact, the car's route over the cobbles of the royal city, between the khaki Cadillacs of SHAPE's somnolent officers, was only the start of a relay race which continues for another half hour: until the cells are mixed with the serum inside the injecting syringes. No hesitation, no error is possible. Doctors and laboratory workers, perfectly co-ordinated, must make only precise and explicit gestures to remain within the allotted time.

The abdomen of the first foetus has just been cut into. Before the blood begins to flow, the doctor has discovered, above the kidneys, two tiny red spheres: the suprarenal glands. The placenta has already been placed in the syringes in the large glassed-in box. The doctor now removes the liver and stomach, filled with blood.

Behind him on a large blackboard, has been written the session's schedule—the list of cells to inject in the patients' colons:

fifteen	syringes of	placenta
twelve	"	of liver
thirteen	"	of spleen
three	"	of kidneys

eight	"	of thymus
nine	"	of thyroid
seven	"	of heart
three	"	of endoartery (the inner lining of the artery)
two	"	of bone marrow
one	"	of total eye

Already an incision is being made in the upper section of the foetus, the thorax. With tiny, expert scalpel strokes in the blue and pink depths, the doctor severs the pink thyroid, then removes the heart, still beating at the end of his pincers. This is one of the most delicate moments. The heart is extremely difficult to dissect. Another doctor works on the arteries. Using a curette with a lace-maker's movements, he removes the endoartery—the inner tissue—which will be injected into cardiac patients.

Meanwhile a third team is busy with the head, stabilized between the clamps of a vice. One doctor trepans the skull, removes the frontal lobe, and brings out the tiny white bean which two assistants are waiting for: this is the hypothalamus, or matter at the base of the brain, whose nuclei are the star endocrine glands. Many contend that the secret of life is found in this conglomeration of cells, a relay organ between brain and spinal marrow; it is accorded an essential role in the formation of all the

other glands, and forms, it is claimed, many hormones of which the pituitary—which appears in its turn—is only the “granary.”

There is a Mongoloid child to treat this morning. For him, a kind of cerebral bouillion is being prepared, in which white matter and gray are mixed together.

From the second embryo, which has just been cut open, rises the same sweet, sickening odor and a warm mist. The laboratory assistants now work without stopping, cutting up glands and tissues by means of knives with mutiple blades. Ten minutes have passed since the animal was slaughtered. The doctor directing the operation consults his watch.

On one of the skulls, a doctor is in the process of enucleating the eye. Half the retina is already plunged into a Ringer solution: a syringe of retina cells is being prepared for an albino child whom light causes unbearable pain. Nearby, assistants are working on adult glands which have just arrived from the slaughterhouse.

All the cells injected do not come from the embryo. For instance, there are no sexual glands in the latter. These are taken from bulls, ewes, or rams after puberty and removed in laboratories from the various envelopes which surrounds them. The tiny bluish brown lentils of the embryonic parathyroid glands being unusable, these glands are taken from

adult animals as are certain others which are utilized in greater quantities or different in the male and female (embryo glands are not "sexed"). The laboratory workers' hands, beneath the transparent glass, have dissolved the cells in the physiological serum and filled the syringes.

Each patient has his own tray on which the prescribed syringes are lined up. Some patients are to receive six injections at once. Others only one. Diluted in the serum, the chopped glands and tissues have a fluffy consistency, fragments bearing principles of life, of various rather violent colors: bone marrow is scarlet, spleen brilliant red, thyroid pink, the pituitary and all the cerebral cells white, the heart pink in the palest serum, the retina blue. . . .

One after the other the trays with their labeled syringes pass through a double window where they are picked up by nurses. Now the doctors can relax. Once more they have fallen within the time limits of extractions and pulverization. All the cells to be injected are in suspension in the serum. They briefly form a culture there, while waiting to form a culture in the patients's serum. This is the "interim."

The injection stage which follows lasts only a few minutes. Each doctor, accompanied by a nurse, visits the rooms in his care. The inmates are given injections after receiving an anesthetic of ethyl chloride, as are the patients from outside the clinic.

There are amputees (after arteritis) whose remaining limb will be saved by fresh cells. (Arteritis specialists announce they have obtained positive results in 90 per cent of the cases treated.) There are diabetics, Monogoloid and retarded children, victims of skin ailments: a complete sample of human suffering.

It is now ten o'clock in the morning.

Doctors and nurses meet again, in the laboratory, over a hearty meal. Like a team which has just won an exhausting match. To make the picture complete, there is even a captain, the only man in a suit-coat among all these white smocks.

And indeed one is reminded of a team captain, listening to the director of this Vaucresson clinic describing the morning's results, giving directions for the days to come, setting up programs, formulating his criticisms. Stocky, muscular, high-colored, bushy-browed, loud-voiced, decisive, he is the promoter of cellular therapy in France. Today, although other doctors in France have devoted themselves to the same therapy, he is the only one to satisfy all the requirements of the discipline committee of cellular therapy, which sits in Frankfurt-am-Main in Germany. He has abandoned all other activities, including the hospital service where he formerly worked, consecrating his entire career to cell injections. He has risked being brought before the courts on sev-

eral occasions. In Étampes (Seine et Oise) he has been accused of itinerant medicine (that is, of practicing in a region where he is not authorized to do so) and of trafficking in pharamacuetical products. He is acquitted. On each occasion the doctor's combative temperament succeeds in overcoming his difficulties.

I saw him recently, walking through the slaughterhouse in Versailles. He has been shown a pregnant animal which is to be sacrificed for his clinic.

He has in his hands the results of the tuberculin skin test and of the various blood tests taken to avoid cattle illnesses, but as if these indications were not enough for him, he has smelled the creature, examined the udders which "wax"—that is, expel a waxy liquid, and sounded the great sad eye.

Until the age of thirty this man ran his own farm. He cultivated his property, fattened and sold his animals. One day he found himself ruined. Not knowing what to do with himself, he passed his baccalaureate and took his degree in medicine.

As a local doctor, he is visited at the war's end by a colleague liberated from a Russian prison camp. This is how he discovers the studies of M. F. Filatov, the famous Russian ophthalmologist who has devised a method of removing tissues (animal or vegetable) and causing them to suffer by a series of operations (pulverization, heating, etc.), thereby giving rise to



“biogenous stimulins” defense elements. By implanting these fragments, Filatov benefits the organism by the defense forces released. The general state improves. The technique of placenta implantation has rendered great services in the military hospitals.

It is interesting to remark on the parallel between Filatov's tissue therapy and Niehans's cellular therapy. Since 1913, Filatov had specialized in the study of blindness caused by corneal wounds. During thousands of corneal transplants, he attempted to revitalize the transplanted tissue, reaching this conclusion: the interrupted growth of a tissue culture about to disintegrate can be reanimated by a graft of a new piece of tissue of the same kind.

This observation was to lead him to his essential discovery: any animal or human tissue separated from the organism and preserved under conditions still compatible with life, becomes the formation-source of special substances provoking vital reactions in the tissue which has produced them: these are the biological stimulants. Introduced into a diseased organism, they also stimulate vital reactions in the latter.

For Niehans, the regenerating weapon is the differentiated cell as a whole. For Filatov, it is a chemical product, a derivative of the organism's disturbed metabolism.

The two methods have only their point of depar-

ture in common—the biological tissue. Niehans (in 1931) and Filatov (in 1933) both undertook an elaborate study of the therapeutic value of this tissue. Their conclusions were different, but remain in the same medical perspective.

The doctor ponders the effects of the fresh placenta; he pays a visit to the principal German laboratory studying the problem. His investigation leads him to cellular therapy, and in 1953 he meets Dr. Niehans. This encounter is a decisive one.

Having returned to France the doctor devotes himself entirely to fresh cells, but cannot treat his patients in France; on each Monday he must take them by plane to Frankfurt. On some days he and his patients fill a whole Air France Constellation!

The invalids receive injections under the supervision of Dr. Sprado, a German promoter of cellular therapy (they have previously been given the Abderhalden test); the injection administered, they return to their rooms in the various hotels throughout the city where the doctor comes to examine them. This air-lift lasts a year. To be precise, until the doctor manages to establish a laboratory for cellular therapy near Paris. This is still a precarious establishment, known only to a few initiates. Aside from an article by Louis Dalmas in *Science et Vie*, no publication has informed the French of its existence.

Orthodox French medicine still is unaware of cellular therapy. When he first sets up his laboratory in France, the young doctor is not taken seriously. He works under incredible conditions, but avoids all demonstrations.

He considers that he has still not treated enough patients, gathered enough observations, recorded enough cures, to formulate an opinion—or to develop his ideas. He seeks no support, he counts only on his peasant stubbornness and his infectious enthusiasm to open all doors. He makes his way by force into the slaughterhouses under the noses of the hygiene inspectors, chooses his animals, argues with the butchers. One of his friends, a veterinary suffering from a serious heart ailment, begs him to administer the injection. He brings a ewe, sacrifices her in the patient's bathroom, and by himself removes the organs, chops them up, mixes them with the serum, and injects them.

An old admiral who has had wind of his success writes him. The admiral lives on the sixth floor of an apartment building in the sixteenth *arrondissement* in Paris. The patient cannot leave his room; there is no elevator. Moved by this misfortune the doctor agrees to treat him.

He purchases a pregnant ewe and the next day valiantly undertakes to carry her up to the sixth

floor. On the staircase he encounters the concierge, who after a moment of astonishment begins barking: "Where are you going with that big sheep?"

"To the admiral's apartment on the sixth floor!" and he has considerable trouble dissuading the concierge from calling the police.

On another occasion he has no other recourse than to inject a patient lying in the back seat of his own car. But patiently he builds up his files, gathers his observations—he has not only cures to report. If this famous actor or that politician, declares himself rejuvenated, if the doctor records spectacular improvements in a whole series of illnesses, he still feels that cellular therapy stands in need of numerous improvements:

"The selection of animals, for instance, requires great precautions. In Germany, foetuses are chosen somewhat by chance at the slaughterhouse, and the doctor is content to test serological reactions on the blood of the placental cord."

These precautions seem insufficient. He decides to set apart a special herd for cellular therapy. In this regard, France has the exceptional good fortune to possess, in Touraine, one of the rare pasturelands where for over a century no trace of cattle disease has been recorded. It is here, on a well-run farm, that the animals destined to furnish their tissues will be born and reach maturity.

Having become the chief French cellulo-therapist, the doctor brings here, each week, one of the young doctors he has been able to convert—who finish their apprenticeship in the Vaucresson clinic near Versailles. He has recreated here precisely the same working conditions as those of Doctor Carl V. Sprado's clinic in Frankfurt. His archives are more extensive. He feels strong enough now to fly in broad daylight the banner of cellular therapy. Especially, since in every neighboring country—in Germany, in Switzerland, in Belgium, in Scandinavia—the cell-cures are multiplying. And besides, the public at large now knows of the existence of these cures. It has required a fortuitous event to bring this about: the Pope's illness, the role played by Niehans and his cells in the former's recovery.

"We are out of the darkness," the doctor says on October 21, 1956.

On that day, in Paris, in the *Maison des Médecins*, the first French congress of cellular therapy was convened. From Germany, where such congresses take place regularly each year, seven professors of medical faculties have accepted invitations to participate in the proceedings. They set forth their results before two hundred French doctors.

During the months which follow, cell therapy centers open virtually everywhere in France: in Bordeaux, in Nice, in Marseilles, and outside Lille.

At the end of 1958, in the Department of the Lot, at Luzech, the first complete institute was opened—an establishment where all operations from the slaughter of the animals to the last checking of the patient are performed in the same place. (It must be recalled that in Dr. Niehans's clinic at Burieh-Vevey, the animal embryos are taken from the slaughterhouses; this is the general procedure in the great German hospitals as well.) With the exception of a single dissident group, all remain in communication with the doctor.

The official position of the Faculté has not changed.

Yet many doctors who had heretofore refused even to consider these treatments now ask for information. They no longer hesitate to advise certain patients whose diseases resist customary therapies to try their luck with new cells. It is now generally granted that allergic reactions are exceptional.

On a certain day before the beginning of the next congress, in October, 1957, in Tours, an event occurs that is interpreted by some as the herald of a change in the official point of view.

Professor Léon Binet, dean of the Faculté de Médecine, in Paris, an eminent specialist in the problems of gerontology, reveals the results he has obtained by treating senescent patients with extracts from bovine embryos. He announces a stimulating

effect on the organic functions in general and on the restoration of tissues.

This is a long way, of course, from cellular therapy, but perhaps the choice of the bovine embryo by the dean of the faculty of medicine is an indication.

## *Conclusion*

*Is the fresh cell man's ally against cancer and death or cancer's ally against man?* It is impossible to conclude, insofar as to conclude means to judge.

Cellular therapy, in 1959, exists only as a debate. The file is continually being swelled by favorable observations and by criticisms. It is as if we were watching a trial in which the preliminary investigations have only begun. No one can foresee what the definitive results will be.

The very fact that the debate exists—and has persisted for twenty years—already provides one kind of information.

For at least Niehans's cellular therapy cannot be added to the list of miraculous medications or treatments (like the innumerable serums against cancer, for instance) on which the credulity of patients frequently feeds—and the purse of certain profiteers as well. Universal or not, all such panaceas are short-lived.

Niehans has not grown rich on new cells (he had inherited a considerable fortune from his father and mother before new cells made their appearance as



marketable substances). If, the world over, certain unscrupulous doctors have "made" or still make cells at high profits and without great precautions, the cellulo-therapists are in general honest and careful doctors, convinced that they wield an effective weapon against disease, suffering and the disorders of old age.

It is possible, as some maintain, that cellular-therapy techniques are not yet perfected and that they occasionally offer certain dangers. Accidents, however, continue to remain extremely rare.

Niehans's studies give pause even to those who reject them. For instance, the official medical bodies in France are entirely unaware of cellular therapy; it is not mentioned in hospitals. Yet, individually, there are extremely few great French doctors who have not at least glanced at the cellulo-therapists' communications and statistics. For some time, though the official attitude has not changed, various experiments have been performed in the hospitals which tend to follow the trail blazed by Niehans.

At the hospital of St.-Louis, in Paris, leukemic children have been injected with a substitute bone marrow after a broadcast appeal to voluntary donors. In this special case, are we not dealing with an injection of fresh cells?

Other studies are in process, at the Sorbonne, for instance.

In America, where opposition remains extremely

strong, an increasing number of doctors recognized by the Deutsche Gesellschaft für Cellulartherapie practice cellular therapy. Almost everywhere statistics circulate which make one wonder.

The results are, in fact, below those claimed by the partisans of the cell, sometimes swept away by their enthusiasm—and above those claimed by their critics.

There are failures and miracles. Between the two, one encounters an enormous quantity of mediocre, average, or good results.

Precise indications are difficult to determine because we are dealing with a biological stimulation whose effects may escape analysis. The best results are obtained in:

Endocrine diseases, diabetes insipidus suprarenal insufficiency, impotence, etc.

Vascular or cardiovascular diseases; arteritis is one of the best samples here (all statistics agree in setting recovery rates at near 95 per cent); Arteriosclerosis often seems to be improved.

Certain skin diseases—eczema for instance—and allergic affections such as asthma and urticaria.

Certain psychical afflictions: cellular therapy has brought improvements in cases where shock treatment and all other therapy has failed.

Mental and motor retardation. Cases of Mon-

gicism have been spectacularly improved. Similarly, all doctors report that in cases of meningitis after-effects in children, results are extremely impressive.

In cases of severe depression, results are obtained in the cases of certain men at the period of andropause.

Finally, senescence: the cells represent a "revitalization" weapon for organs that are weakened but not diseased.

It is in this last area that cell injections have their maximum effectiveness. They frequently reinforce the vitality of the weakened organism, and thus seem to deserve the title "rejuvenation treatment."

But their essential merit is perhaps elsewhere: they have compelled doctors to consider the problems of cellular constitution—the very basis of life itself.

In the middle of the last century, a famous German doctor, Rudolf Virchow, proved that in the majority of cases diseases of the cell preceded diseases of the organism.

His discovery, known as "*cellular pathology*," emphasized the cellular architecture of the human body (the number of cells constituting an individual is today estimated at forty trillion).

Virchow put the accent on the cell as "life bearer,"

though it is in itself a tiny organism. But little was known about the composition of the cell.

One must look as far as Carrel to reach the following stage—that of “*cellular biology*.” Henceforth, thanks to the chicken heart, the possibilities of the cell’s eternal youth were known—on condition that it be maintained under certain particular conditions. Carrel then demonstrated the influence of healthy cells on sick cells: exhausted cultures, on the brink of death, received corresponding new cells, and soon the entire culture was restored to health. Incapable of adequately defining the “why” of this improvement, Carrel had to admit that the wisdom of nature places a powerful capacity for regeneration in the young or embryo cells.

In 1932: “discovery of *cellular therapy*”: Niehans is set on the road by chance.

In twenty-six years he administers 12,000 injections. He does not hesitate to perform injections of new preparations on himself. He declares he has discovered the means of bringing to the forty trillion cells which form the human organism a powerful revitalization by the addition of embryo cells or of cells from young animals.

Whereas Virchow—for his cellular pathology—and Carrel—for having laid the foundations of cellular biology—are universally recognized and hon-

ored, Niehans is still a controversial figure at the center of a furious debate.

We have seen what criticisms he has provoked—and to what degree certain partisans of the “embryo theory” of cancer regard him as a harmful practitioner. Niehans himself contests the scientific well-foundedness of these criticisms. Refusing to see in them anything but a pretext, he regards himself as the victim of his colleagues’ jealousy.

He confronts them with his statistics: among the ten thousand persons who have received injections of new cells in his clinic, the ratio of later cancers is lower than the cancer ratio among ten thousand persons chosen by chance and studied during the same period.

Better still, Niehans declares that the cells will ultimately permit cancer to be overcome. He has performed one experiment “*in vitro*” which proves that cancerous cells in full growth cannot contaminate new embryo cells added to the culture: they must pass around them!

Statistics show that during the transitional period between maturity and old age there is a high incidence of cancer. This period corresponds to a decrease of genital hormones and to an increase in the growth of pituitary hormones. These pituitary hormones, specializing in growth, once again have

free rein. Crossing damaged or weak areas, they may well provoke there a kind of anarchic and fatal second growth, known as cancer.

This is Niehans's theory: He proposes a cancer prophylaxis of two phases: first, stopping this belated impulse of the pituitary growth cells at the right moment—by injecting genital-gland cells (in men, testicle cells, in women, follicular cells of the ovary); second, revitalizing the damaged organs which offer a springboard to the growth hormones seeking such an opportunity.

Niehans has administered this treatment to more than a thousand men and a thousand women at the critical age during which cancer most frequently develops. He declares that this kind of "vaccination" has been effective.

This is the file with which he confronts those who—on the contrary—accuse new cells of provoking cancers.

The entire debate is articulated around this controversy, for all other criticisms, such as that contending the risk of shock, are secondary.

Once again, one can merely present the evidence. It is impossible to be sure of the final verdict. The trial of Dr. Niehans, accused of cellular therapy, will remain in session for many years to come.

(continued from front flap)

volving injections of animal embryo cells. It tells how Niehans, a great-nephew of Kaiser Frederick III, followed with distinction two careers — in the Reformed Church and in the Swiss army — before beginning the decades of intensive medical study which were to lead him to the discovery of a therapy to combat the diseases and weaknesses of old age.

Gilles Lambert, who was granted one of the few interviews Dr. Niehans has allowed, tells a fascinating story of the doctor's eventful life, presenting for lay readers the facts about cellular therapy and relating the often amusing story of previous attempts by medical men to discover the fountain of youth. In the end, he leaves it to the reader to judge whether Dr. Paul Niehans will be remembered merely as one more gifted experimenter, or as one of the greatest men in medical history. In either case, *CONQUEST OF AGE* is proof that Dr. Niehans has rightly been called the world's most controversial doctor.

**GILLES LAMBERT** is a young French journalist whose specialty is interviewing famous people. At present, he is Foreign Editor of *Constellation*.



*Roma Press Photograph*

Pope Pius XII greeting Dr. Niehans and his wife

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